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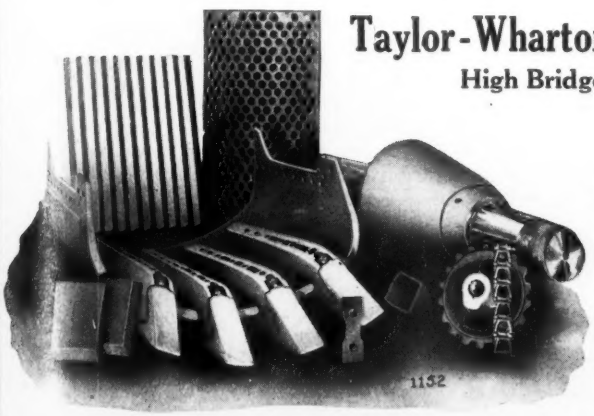

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NOVEMBER, 1920

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Sand and Gravel

EVERY year the consumption of sand and gravel increases tremendously. Concrete buildings and roads provide a constant demand for good, clean, washed and sized gravel and clean, sharp sand free from loam. To meet the strict specifications of engineers it is necessary to equip at the pit with thoroly modern screening and washing equipment.

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Pit and Quarry

A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime
Member Audit Bureau of Circulations

VOL. 5 CHICAGO, ILL., NOVEMBER, 1920 NO. 2

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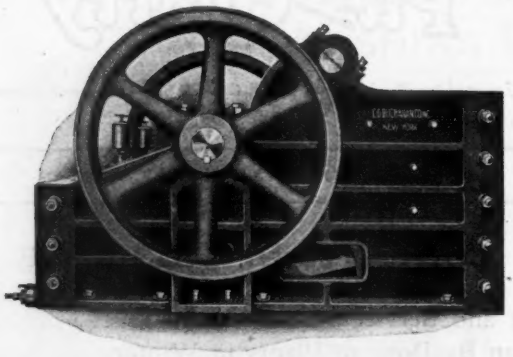
Crushers of Unusual Strength



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CRUSHING PLANTS COMPLETE—MAGNETIC SEPARATORS

Pit and Quarry

Vol. 5 Chicago, Ill., November, 1920 No. 2

Progress and Service

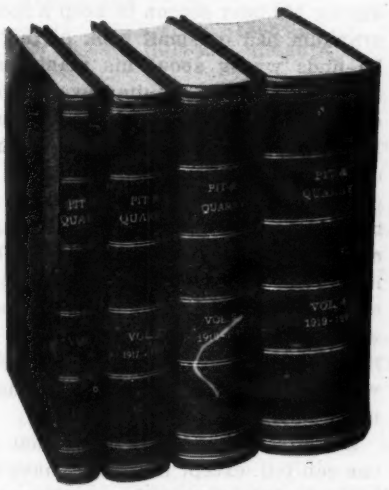
HERE is presented graphically a story of progress—progress founded on service.

The bound volumes of PIT AND QUARRY above show more than the development of a business journal. In many respects they typify the development of the business itself.

When PIT AND QUARRY was started in the small and modest way represented by the first bound volume, as the first publication to serve these industries, there were misgivings as to whether the demand would justify such a journal. But it found the field unusually responsive, eager for a medium through which to find adequate expression.

Not only did the men in these industries seize upon this as a much needed business aid and exponent, but manufacturers and dealers serving this field, soon came to recognize it as the most direct means to reach the enormous buying power here represented. Indeed not the least service which PIT AND QUARRY may have rendered, is in furnishing a direct advertising medium, without which many manufacturers would have been reluctant to develop machinery for this field. This journal can therefore feel that it has had some part in developing the industry mechanically as well as from a business standpoint.

The years represented by our four annual volumes have been troublous years, fraught with uncertainty, and industrial upheaval, and the diversion



of attention from the ordinary work of constructive business development.

But it is a pleasure to record that the pit and quarry industries have come through to the present period of readjustment more unified, larger, better organized, better recognized in the world of business, more competent to give a good account of themselves.

PIT AND QUARRY attributes no small part of its successful growth to its complete service to the entire field without discrimination, seeking out every operator and placing the journal on his desk regularly each month. The fact that they have used it—have read its editorial pages and have used its advertising section as a monthly revised catalogue of materials and equipment—is the only basis on which a growth, such as is indicated in the illustration, could have been realized.

What Can Be Done to Plants in Winter

BY DANIEL J. HAUER

MANY pit and quarry operators shut down their plants during the winter season; and even those that do not close down entirely, run irregularly or with reduced capacity due either to inclement weather or to a lack of sales.

It is advisable for every operator during his busy season to keep a memorandum pad or small book of things he finds wrong about his plant, how small things can be improved, what changes may be advisable to increase his plant capacity, and many other details. Thus when the time comes to do the work there is a record of all that may be advisable to do, although after careful consideration some notes made may not be followed. Lacking such a memorandum—and many operators have not kept such notes—a list of things that may need attention will be given in this article based upon such notes kept by others.

But first there is one thing that no one can tell, except those who have inspected a plant, and that is, how the capacity of a plant can be increased without installing new machines or materially increasing the capital investment. This is the most important, as frequently by a few minor changes the capacity of a plant can be increased from 10 to 20 per cent. A plant with a rated capacity of 100 tons per day may be producing 70 tons. A change easily effected may give a production of 85 tons. Thus for a comparatively few dollars 15 tons per day are added to its capacity, an increase during the season of more than 3,000 tons, nominally all "velvet" to the operator.

There are on record many such cases of increased production. One operator producing sand from rock found that by building a hopper-shaped bin over his crusher he could be feeding the crusher continuously, while by his old method the crusher was idle part of the time as the cars were being shifted, when the rock was dumped directly into or alongside of the crusher. This slight change materially increased his production, speeding up his entire plant and keeping the men at the ledge steadily at work.

There are many ways of effecting such increases. An extra track or a re-arrangement of track may do the trick, changing the speed of machines, re-arranging elevators, screens, bins or in fact anything that means the saving of time and forcing the machines and men to the limit. It is very true that today it is difficult to force men, but it must be remembered that machines can set the pace for any job, and men are unconsciously spurred on to greater efforts by the buzzing and humming of revolving machinery. Let the carriage of a saw mill be slow acting and men will handle logs on it at the same slow speed, but have a quick traveling carriage and the men will flip a log over in a twinkling, the logs are clamped down and in less time than it takes to tell it the saw is ripping through the log.

Speed is essential to large production, but service is just as important, hence the operator should be alert to see how and where the service to a machine can be improved. This service may mean the placing of an extra man or two, or it may be that some simple device or machine can be installed to increase the output of the plant.

The idea frequently comes to the operator that his plant should be rearranged and enlarged. This means that instead of increasing the output of the plant possibly 10 to 20 per cent.

its capacity will be doubled or even made much larger than this. Such a change means the rebuilding of the plant, and certainly the off season of winter is the time to do such work.

The operator has his own money to spend, and he is skilled and experienced in operation, consequently he knows just what he wants to do and the results to be obtained; but this does not necessarily mean that he is the best man to design and make these changes and alterations, nor in rebuilding make the enlargements, for many operators are not experienced in designing and building plants.

This is but natural, as they seldom build more than one or two plants in a lifetime. It is for this reason that many plants are poorly designed, making the cost of production so large while the output is so limited that it is impossible to make a profit.

Today we have in the engineering, construction, and manufacturing field, men, who are experts in designing and building plants, as they do little else, frequently having more to do in this line within a few months, than the ordinary operator will in 30 years. The assistance of these men should always be obtained. Such a man, consulting and working with the operator or owner, is likely to obtain the best results.

The following list of things to be seen to during the winter season is made up from quarry records, but many of them are applicable to sand and gravel operations, while others will suggest additional or similar things to do. It is not supposed to be complete in any detail, but is ample to make owners look over their plants to see how improvements may be made.

In the Quarry

Try out using larger diameter drill holes with well drilling apparatus.

Experiments in springing all sizes of blast holes in order to secure cheaper blasts.

Change air pipe lines to cut out unused portions and put in new connections for necessary extensions.

Inspect and repair explosive magazine and also detonater and fuse house. Clean up the ground around them.

Repack pumps and adjust valves.

Arrange for better drainage of quarry floor.

Look into improved methods of stripping.

Change positions of derricks.

Clean up, overhaul and make repairs to steam shovels.

Repair and make changes in cars.

Make changes in track layout in order to save rails and distance in car operation.

Re-locate scales.

At the Plant

Change the feeding platform to save labor.

Re-babbitt and adjust crushers.

Put in new jaws or head in crushers.

Protect belts better from the weather.

Re-align power shaft and tighten up hangers.

Clean out and drain elevator pit.

Replace worn links on elevator, line it up and replace necessary buckets.

Renew worn parts of screens.

Repair foundations of crushers.

Repack and adjust engine.

Put steam trap on low point of steam pipes.

Consider installing water heater for boilers.

Put soot blowers on boilers.

Install flow meters on boilers.

Repair fire box and walls, inspect grates and see if they can be improved.

See that all safety guards are according to standards and in good condition.

Inspect and repair all stairways and ladders.

Inspect and adjust all conveyors.

Have boilers inspected for new insurance and steam pressure.

Loading Equipment

Inspect bins and make necessary repairs.

Repair and adjust bin gates.

Repair loading chutes.

Clean up and repair loading track, and see if grade can be improved with the loads.

Repair wagon road to bins.

Overhaul and adjust conveyors.

Arrange for more stock piles.

Arrange for better methods of rehandling material from stock piles.

Talc Mining and Milling, Madoc, Ontario

By RAYMOND B. LADOO

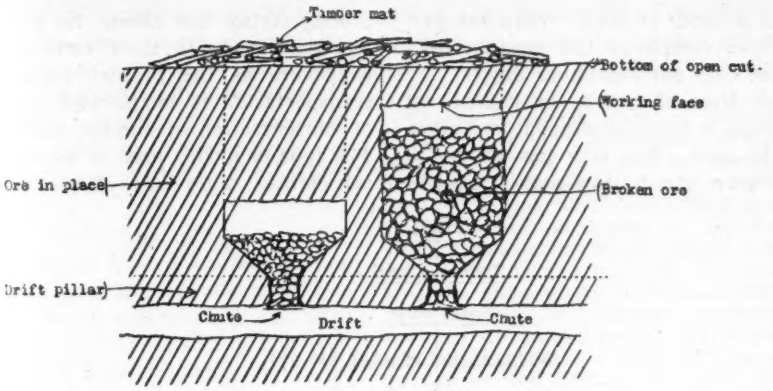
Mineral Technologist, U. S. Bureau of Mines

DEPOSITS of talc are known in many districts in Canada but at the present time active mining operations are reported only in Ontario. Here three companies are now operating, two of which, George H. Gillespie & Co., Ltd., and the Anglo-American Talc Co., are at Madoc. The operations of the former company are probably the largest and best known in Canada. The writer, in his capacity as an engineer of the U. S. Bureau of Mines, was permitted by this company to make an inspection of its mine and mill in June, 1920, and study the methods employed. This information was desired for comparison with methods employed in the United States. The following description is based on observation made during this visit, supplemented by data supplied by the company.

The mine and mill of George H. Gillespie & Co. are at Madoc, Hastings County, on the Grand Trunk R. R., in the Province of Ontario, Canada, the mill being situated on a siding opposite the station and the mine about two miles distant. The mine, known locally as the Henderson mine, has been operated for a number of years by different companies, but only under the present company has the operation been particularly successful. The early work done was all open-pit mining, but at present all the talc is being removed by underground mining methods from beneath the bottom of the old cut. The ore deposit seems to be of the shape of a flattened inverted canoe dipping to the south at a steep angle. It is underlain and overlain by crystalline gneisses and schists and is intimately associated with dolomite, from which the talc was probably derived. The talc is white and crystalline, varying from very soft to medium hard. Dolomite and calcite are common impurities, occasionally feldspar and quartz, and sometimes pyrite.

On each flank of the "canoe," vertical shafts have been sunk in the ore. The east shaft is now being used for hoisting, but a new vertical shaft is being sunk in the foot wall near the middle of the bow. The present haulage level is at a depth of 200 feet but the new shaft will be 300 feet deep and will develop a new level. The vein varies in thickness from 15 feet to 70 feet, with an average of 35 feet. The vein from wall to wall is of good grinding stock and no waste is made except in rock development. The workings are 700 to 800 feet long, but it is probable that the vein extends for at least twice this length within the boundaries of the property.

The method of mining now in use does not follow exactly the one that will be used when the new shaft is complete, due to the fact that previous operators developed the mine; but the differences are of minor importance and the ideal method will be described. From the new shaft a cross cut will be driven to the vein and 6x6 foot drifts run along the foot wall outlining the ore body. At intervals of about 20 feet along the drift raises are put up, usually on the hanging wall side. After leaving a horizontal pillar to protect the drift the raises are widened out into stopes the full width of the vein. Timbered ore chutes are provided at each raise and additional man-way raises are cut where needed to give access to the stopes. Only sufficient ore is drawn off from the



Sketch of vertical section along drift

chutes to keep the broken ore level in the stopes close enough to the ore in place to make drilling easy. Overhand stoping and drawing off ore is continued upward until a timber mat which was laid down in the bottom of the open cut above is encountered. The stope is then considered finished and is allowed to remain full of broken ore. When the ore is needed it may be readily drawn off through the chutes and the drawing continued until surface waste appears. The drift pillars keep the drift open even after all the ore is drawn and the stopes filled with waste. It is stated that, by this method, when the stopes are full of ores a production of 100 tons per ten-hour day can be maintained with only five men, four underground and a hoist man at the top.

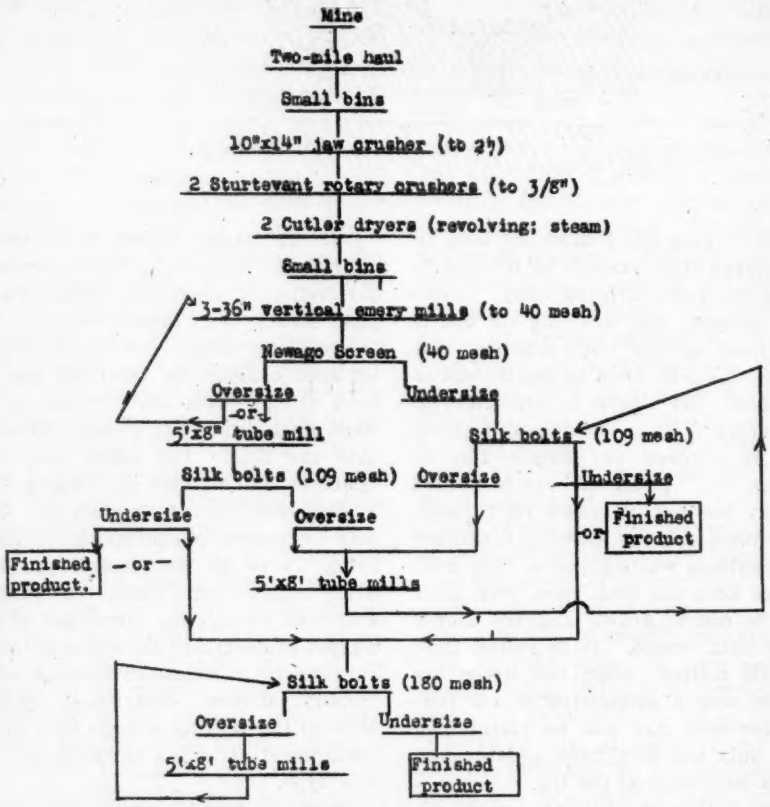
This method of mining has many advantages. All ore is broken by overhand stoping; many working places are available; few men underground are required as no shoveling is necessary; no timber is needed in stopes; large storage for broken ore is available at no cost; ore is not liable to be water-soaked as the stopes drain themselves. The principal disadvantage is that ore may arch or hang up in the chutes, but usually the jam may be broken by shooting with dynamite. This method of mining is well known in metal mines where it is called "shrinkage stoping." It is excellent for veins of moderate width which have strong, well defined walls.

From the chutes the ore is drawn off into one-half or two-third ton 18 inch gauge, steel cars, trammed by hand to the shaft and dumped directly into the skip. The shafts are well timbered and divided by lagging into a skip way and a ladderway. Sollars or lading platforms are located every 15 to 20 feet vertically. The drifts require some timber but in general need no lagging. Drainage is not a great problem and the water is taken care of by a small three-stage electrically driven centrifugal pump. Most of the drilling is done with small compressed air drills of the jack-hammer type.

At the surface the skips dump automatically into a bin, provided with several loading chutes, from which wagons or trucks are loaded. In the power house are a double-drum hoist geared to a 15 horsepower, 220 volt, A. C. motor and a 10x12 inch single-stage air compressor belted to a 40 horsepower, 220 volt, A. C. motor. The total installed horsepower at the mine is 70 but the load ordinarily carried is much less. Production is now about 50 tons per eight-hour day and the capacity under present condi-

tions is about 80 tons. When the new shaft is completed the capacity will be 100 tons per eight-hour day.

Ore from the mine is hauled, on contract, a distance of about two miles to the mill. The mill has grown to its present size by successive stages in such a manner that the present arrangement is not ideal, but the efficiency of the milling process is high. This difficulty, common to many mills which have grown with unexpected rapidity, will be eradicated in the new mill which is contemplated.



Flow sheet of mill

Ore from the mine is dumped into a small bin from which it is drawn off and fed by hand into the crusher. The progress of the ore through the mill is indicated approximately in the accompanying flow sheet. No attempt has been made to show elevators or conveyors as the present system of transportation is complicated by lack of concentration of similar machines. The type of dryers used is unusual in talc mills. They are of the Cutler type, made by the Nordyke-Marmon Co., for use originally as corn dryers. Essentially they consist of a bundle of steam-heated pipes set in circular headers which are revolved mechanically about an axis nearly horizontal. The talc enters at one end and is cascaded around and between the hot pipes until it reaches the other end. The drying temperature may be regulated very closely, thus guarding against overheating, and there is no

soot or ashes to contaminate the product. It has been found advisable to convey the dried talc for some distance in the open air before being fed to the next machine. This allows the moisture which has been driven out from the pores of the rock to evaporate.

The opinion has often been expressed in the United States that the bolting of talc through silk cloth was obsolete due to slowness and excessive cost. This mill demonstrates that bolting can be done efficiently and economically if proper precautions are taken. The secrets of success here seem to be : (1) careful sizing of the talc before bolting; (2) the utilization of a large number of bolts; (3) no overloading of bolts; (4) intelligent and careful supervision. Another feature of this mill is the use of short (5x8 foot) continuous feed and discharge tube mills, instead of the intermittant dump cylinders or the long (6x24 foot) continuous tube mills used in other parts of the country. Furthermore the tube mills here are used singly in closed circuit with bolts, instead of three or four in tandem. This close and careful sizing not only produces a very uniform product but cuts down greatly the power consumption for grinding.

Three grades of ground talc are ordinarily made here, based on color and grain size. The most important consumers are the toilet powder, textile and soap industries. The present mill capacity is about 50 tons per 22-hour day, for the production of which about 140 horsepower is used. The erection of a new mill of 100-ton capacity, but following the present system of milling, is contemplated.

The mine of the Anglo-American Talc Co. is close by that of the George H. Gillespie Co., Ltd., and is said to be on the same vein. No opportunity of visiting the mine and mill of this company was afforded, but it is reported that the system of milling resembles that used in the Gouverneur district of New York state.

Consul Frederick Simpich, attached to the American Commission at Berlin, reports that the German farmers are complaining of the serious shortage of nitrogen fertilizers. Germany's production of ammonia in October, 1918, amounted to about 32,000 tons. After the conclusion of the armistice and the subsequent political changes in Germany the output gradually dropped to approximately 18,000 tons a month, an amount that may be regarded as the average monthly production during the entire year of 1919, except in April, when the production decreased to 7,000 tons.

The International Agricultural Corporation has in process of erection an entirely modern and up-to-date phosphate plant near Wales, Tenn. A spur has already been built from the L. & N. railroad to the phosphate beds, and the fields are now being graded. The separation of the phosphate from the earth will be effected by means of the high pressure water system and pneumatic pumps. Light and power will be supplied by the Tennessee Power Company. O. L. Dortch is superintendent. Operation will begin as soon as the plant can be completed.

Columbus, Ohio, is bustling with building activity in the fertilizer industry. The Federal Chemical Company, of Louisville, Ky., has just completed an extension to their plant at Columbus; while the Welch Chemical Company of Columbus are erecting in their city an addition to their present plant. A contract has been awarded for the construction of an additional factory of the Farmers' Fertilizer Company, likewise of Columbus, Ohio. The Chemical Construction Company of Charlotte, N. C., has been in charge of all of these constructions.

Application has been made to the Board of Commissioners of Everglades Drainage District by the International Products Company of Boston, Mass., to secure a permit for occupying a location on West Palm Beach Canal, near the Florida East Coast Railway, for the erection of warehouses and a fertilizer manufacturing plant.

When Love Spoke

by Frank A. Halverson

TO ONE who has spent an active life among the men who work underground, in mines, pits or quarries, especially in an official capacity, and earned the name of "Mister Tom," it means having an understanding heart for one's fellow men. In my case, the hardy men have all been my boys. They've told me their troubles. It has been up to Mister Tom to help them out, and if it has been within the realms of possibility I have favored them. What can be a greater monument to any employer than to have the esteem of his men? The rule of giving unto others their just dues has worked to my advancement. It's because of this fact that I happen to know the story of Sweetheart and Georges Fanchette.

Georges Fanchette was a Frenchman and a quarryman who had drifted away from his home across the ocean with the scars of conflict on his body. He was a powerful, stockily built man with an abundance of muscle and brawn in his sturdy body. There was a quickness and vitality about him that none of my other foreign workers possessed. His dark eyes were alive with the fire of impetuous youth. Above a high forehead clustered a mass of curly hair that Georges loved to expose to the wind of our mountainous country. From his lips came songs that I could not understand, but there was something in Georges' singing that sort of clutched at my throat and tightened the tender strings around my heart. Somehow he put a feeling into the softly warbled words that went right home. Ofttimes when the white moon was shining over the wooded hills, Georges' song would come on the gentle breeze, sweet and clear like music from an enchanted shore. Again, in the pit with the white dust swirling from the short, choppy blows of the Jack-drill, the heart of him was singing above the noise. Georges was happy and I knew that his heart was as free as the white clouds that sailed so gracefully under the blue sky. Ordinarily, my foreign workers would lose days in carousals when they would not work, but this was never the case with Georges. Wandering over the hills of Limeville was his pastime when he was a stranger, and then I noticed that he began to stay rather close to our post-office. There was a reason, to be sure, a fair one in Sweetheart, our postmistress. She was the magnet of our community life. She was always doing something for others, and such a girl! I called her "Everybody's Sweetheart," but as I am an old man, I received the sweetest smile from her laughing lips as her acknowledgment of gracious acceptance. Of course, at my age she forgave me for kidding her about the handsome Georges that loitered around the office where he had met her when he was sending money orders to some little village in France. By his embarrassment when he said, "Evening, Mister Tom," and edged up in the corner by the writing desk, I surmised that Georges had been caught like a boy stealing apples, and the spirit of mischief caused me to wink my eye at Sweetheart through the mail window, and she would wink back so

that Georges would not see her, in the most awkward manner. She was comical. She couldn't get the knack of snapping her blue eyes without twisting her face into the most grotesque contortions, but she was game and did the best she could, and then she would laugh happily. When I was leaving I would smile at Georges and nod my head toward the window as a cue for him to play the part of the world-old Romeo. Being acquainted with the ways of human beings, I knew that Sweetheart cared for the dark-haired Georges, and that he loved her was so apparent that my heart was full of happiness for the two lovers; but he was bashful and timid. At any rate, they were enjoying their springtime, and what's life without memories? In their love-making I lived over my own halcyon days. My romance had ended in a little mount far away from Limeville. Not many knew why "Mister Tom" was a bachelor, but Sweetheart shared my secret and the heart of her cried out at my loneliness and I was to her as a father confessor.

One morning I made a discovery. It was when the day shift was going into the pit that Peitro's little boy came into "Mister Tom's" office and told me his father was too sick to be out that day. Peitro was my foreman and mighty necessary for the safeguarding of the men. The best I could do was to call Georges and ask him to run the pit during working hours. He accepted gladly, and thne he said:

"Some day I'm going to be a steady boss for you 'Mister Tom.'"

After Georges had taken the men into the pit and the cars were coming out with the usual regularity, I got to thinking about Georges' statement. It was so characteristic of the man, not boastful or pompous, but a quiet, studied remark. Back of it lurked something big. I saw Sweetheart's influence behind his declaration. I smiled to myself as the morning sunshine filtered through the office window. Wasn't it like her or like women the whole world over to want only the best for their men But how could

there be an understanding between them when Georges was so bashful?

That evening when the men came out of the pit I had ample proof of my surmisal. Georges was giving the day's report to me in the blacksmith shop when one of the mule driver's happened to tell a fellow driver that the "Frog eatin' Wop had given him Hail Columbia for whipping a balky mule."

I noticed Georges face pale and then crimson. Although I had no chance to approve of his action for stopping any wanton cruelty, yet I could not say a word before the driver launched his second attack.

"The damned Dago thinks he's the super since he's become the assistant post-master."

Georges left my side with a spring and his hands clutched the throat of the driver in a vise-like grip. He bore him back and the fury of hell was in him. Never have I seen a man so completely mastered by passion. I tried to pull him away from the insensible driver whom he was determined to tear into shreds and, finally, with the assistance of two other men we got Georges off his man. He was crying with rage.

I comprehended more clearly the state of affairs. Calling Georges the assistant post-master had been a slur on Sweetheart and he had resented it with manly promptness. Insults when applied to himself, he had answered with a shrug of his shoulders, but when it came to Sweetheart his fury was terrible.

I led him away and talked to him and finally he quieted down. He begged me not to tell Sweetheart, but I knew that she would have the news as fast as it could travel, because nothing is ever kept hidden in a small village.

"Why not tell her?" I suggested.

"No, no," protested Georges.

It was easy to surmise that he thought she would be displeased and that was something that he wished to avoid.

When I greeted Sweetheart that evening I knew from her serious face she had already heard the news of the fight. That wasn't surprising. Most of the young fellows would take delight in spreading the story as they were a bit jealous of Georges because he was the favored one. I did not blame them. Man, no! I havn't forgotten the days of my youth or how I acted then.

I kidded her as usual but could make no headway. Finally she asked if Georges was terrible angry and my answer was, of course, that he had acted about the way any man would who had heard anything disrespectful of his Sweetheart. That brought a coy smile. I followed up my advantage by telling Sweetheart that if Georges had not chastised the driver I would have done so myself. That helped considerably. I could read it on her brightening face.

"I'll tell him tonight," said Sweetheart, "that he mustn't fight for me any more."

I recalled another girl who used to tell me not to do a lot of things years ago, and I had promised just like Georges would do and like all men will to the only girl; but keeping those promises! Ah, men are built that way.

That night Georges did not show up at the post-office. I know because I heard him singing by the big rock that topped the hilly ridge facing Limeville. It was a wild song, full of fire. Later, when the gloaming had turned into mysterious twilight his tenor came soft and low on the night air. The hell in his heart had melted and love had taken its place. Alone he fought his battle.

And Sweetheart waited for Georges on the vine-clad porch. Oh, yes! I heard the hammock screeching. It didn't do so when two were swinging.

Next morning I called Georges into my office.

"Sweetheart was waiting for you last night," I began, feeling him out.

"I know," replied Georges. "I couldn't trust myself, so I went out and sang to the wild things of the woods. I couldn't take my lesson."

"Lesson," I repeated, "what do you mean, Georges?"

"Oh, don't you know, 'Mister Tom' that Sweetheart has been teaching me to read and write, but last night I wasn't right here!" Georges placed his hand over his heart.

Then I understood his remark of a few days back when he had told me that he expected some time a have a big job with "Mister Tom." The little minx! Was Sweetheart trying to make a man out of Georges according to her standard? Georges had a long way to go, but with Sweetheart's help I felt that he would make it.

"I've got my first naturalization paper," said Georges proudly.

"Giving up the old country?" I asked, secretly pleased at Georges for becoming an American citizen at his first opportunity.

"Yes," replied Georges, "I remember old Father Peirre saying that I belonged to France while I lived there. I fought for her, Mister Tom. I paid my debt, and now I am leaving my father and mother"—Georges stammered and hesitated and I finished the sentence by saying:

"You're going to marry and build your home in Limeville?"

"Maybe, 'Mister Tom'," said the big fellow, "when I get my second paper."

"Have you asked Sweetheart?" I questioned, surmising his fatal weakness.

Georges' face flushed crimson. "I can't," said he with open frankness.

Poor fellow! How I pitied him. But isn't love that way to all?

Through the spring and early summer Georges sang and worked and Sweetheart smiled among her letters and the old hammock did not screech any more, because it never did when two sat in it. The flowers bloomed in our quiet village, nestling in a hidden nook of the Allegheny mountains like a bird's nest in a sequestered spot, until I received a notification that the directors of the Limestone Company were coming to make an inspection of all their property. That didn't scare me at all, because everything was in fine shape. The party arrived. It was a typical outside crowd, which included the president, his son and daughter. They were the lively scamps, those two. Just good-natured, care-free children on whose capers their father smiled benignly. But the climax was reached when Miss Eveline began tormenting Mr. Parker to take her into the lime pit. She wanted to go into the bowels of the earth where everything was dark and spooky. Why, her whole trip would be ruined miserably unless her request was granted. She pouted most bewitchingly when her father said "Mister Tom" was in charge. Her clouded face brightened and she came toward me like a sun-kissed morning on the hills. The beauty of her girlishness! The eager expectancy of her face!

Ah! I endeavored to look stern. I summoned to my face the most forbiding aspect that I could muster and I tried to put on the regal bearing of a monstrous potentate, but what was the use? My heart was laughing and the joy-wells of my being pulled the strings that released the sternness of my face into a ripple of smiles. Of course I promised and I thought Miss Eveline called me an "old dear," or some fitting word as she ran laughingly out of the office.

"Tom, you're helping to spoil her," said Mr. Parker, but in his eyes and face there was something that only perfect love can give to a man. How

(Continued on page 80)

General layout of plant of Cass City Sand and Gravel Company

Two New Michigan Plants

UP around Cass City, Mich., the gravel road finds much favor, especially with all the gravel right at hand, while other materials are at the far end of an uncertain car supply.

There is also a shortage of cars for gravel, for that matter, especially during the sugar beet season; but the hauls are not long, and a few cars can be made to do good service if properly handled.

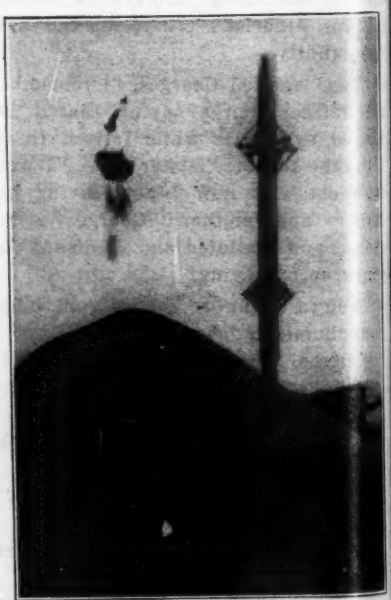
Then, too, one of the producers at Cass City has worked out a plan whereby he can load onto flat cars, building up 24-inch sides with planking and stakes. This would be an expensive proposition on long miscellaneous shipments, with the chances all in favor of never getting the planking back; but these shipments are made to road jobs in the county, with suitable arrangements made for getting the cars and planking right back to the plant.

This plan has proven a "life saver" for both the producer and the contractor; and after the season is over the lumber will still have a salvage value.

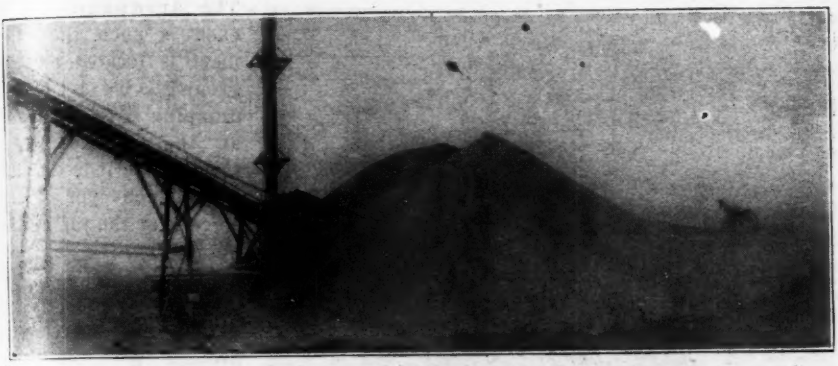
It was a rather unusual sight to see ten flat cars back up to the plant while the writer was there. Aside from the fact that they were flat cars, which is an anomaly in itself, there have been few opportunities this season for seeing ten cars at a sand and gravel plant all at one time.

This method of operation was the invention of John Caldwell, manager of the Cass City Sand and Gravel Company, whose plant began operations about mid-summer.

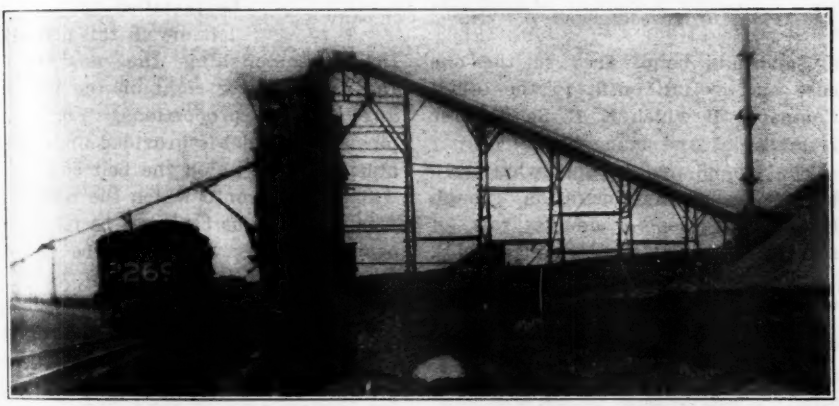
In fact, two plants started in Cass City about the same time, the other being the Tuscola Sand and Gravel



Sauerman bucket in action



Ground storage over tunnel feeding belt conveyor



Note particularly tunnels under bins from which delivery will be made by belt conveyor

Photo taken near hoist house

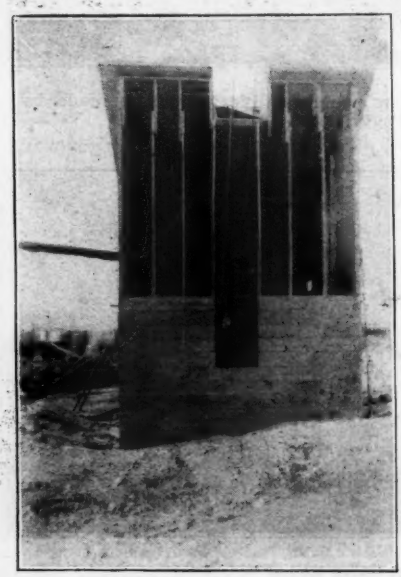
PLANT OF CASS CITY SAND AND GRAVEL CO., CASS CITY, MICH.

Plant of Tuscola Sand and Gravel Company

a Sauerman being used in the one case and a Dull outfit in the other. Company, of which E. B. Schwaderer is president and manager.

The two plants are somewhat similar in design and operation, though the former has a double row of screens, giving it the larger capacity.

Each plant is doing its excavating with a dragline cableway excavator,



Thomas hoist operating drag-line excavator

The arrangement of each is such that the mast is located on the ground, the bucket dumping over a tunnel at the ground level, from which it is carried by belt conveyor to the screens at the top of the plant.

In each case, also, the bins are so constructed that, while delivery at present is from side chutes directly into cars, belt conveyors can be installed to provide delivery in this manner, thus accomplishing the mixing of the various sizes right on the belt in any desired proportions. For this purpose a tunnel is provided under the bins, through which the belt conveyor will run, and onto which the material from the various bins will be fed from overhead gates which can be set to allow any desired rate of flow.

The Cass City Sand and Gravel Company has 240 acres of ground, about half of which is covered with gravel. The other half is a deposit of clay, suitable for clay products, which may later be developed. The plant was designed by Stephens-Adamson Company of Aurora, Ill., and the screening and conveying equipment put in by this company. The screening and elevating equipment is operated by a 125-horsepower Corliss engine, while the cableway is operated by a Thomas steam hoist.

This plant has about 3,000 feet of side track.

The Tuscola plant has a Fairbanks-Morse gasoline engine, and an Ingersoll-Rand steam hoist for the cableway.

Both plants are looked upon as valuable additions to the business interests of this thriving little city, and give every evidence of making good.

The Efficiency of Blasting

"HOW many tons or cubic yards of rock should be blasted from ledge with a pound of high explosives?" is a question that is frequently asked not only by quarry men but also by excavating contractors.

Naturally the answer must vary with the character of the rock and the size of the blast. With shallow holes the efficiency of a blast can hardly compare with those made from deep holes. Another factor entering into the question is the strength of the powder.

Generally speaking, the basis for considering the strength of powder is that of 40 per cent dynamite, this being the high explosive in most common use.

Limestone and some sandstones should show better results than gneiss, some schists, trap rock or granites, yet it is quite surprising how little difference is shown in the different kinds of rock when large blasts are made, and the holes are spaced properly and charged by men of experience.

It would be of interest to have quarry men send to this journal records of blasts. To do this, the weight of the stone per cubic yard, solid measure, should be given, the size and depth of the holes, and whether or not the holes were sprung, and the amount of powder used in each hole, giving the amount used in springing and the charge of each hole when blasted, should be recorded. The kind of powder used should be made known and the number of tons loosened. With a number of such records it would easily be possible to see if efficient blasting is being done.

The writer has before him some records that may be of interest.

In a trap rock quarry with 20-foot holes 8 tons of rock were blow down for each pound of 40 per cent high explosives that was used.

In a trap rock quarry with 20 foot holes 8 tons of rock were blown down for each pound o f 40 per cent high explosives that was used.

In another blast of trap rock using 40 per cent dynamite 5 tons per pound were loosened.

In a limestone quarry with deep well drill holes in a ledge said to be about 100 feet high from 1¼ to 1½ tons of rock were loosened with each pound of 60 per cent dynamite.

In hard sandstone with holes 30 to 35 feet deep, using 40 per cent dynamite, 3½ tons were blown down with one pound. In hard granite with holes running up to fifty feet in depth, using 40 per cent dynamite, 5 tons of rock were loosened for each pound of powder used.

In a large blast put off by means of tunnels driven into a ledge of gneiss, 40 per cent dynamite being used, 3 tons of rock to the pound were loosened.

These few records show the great variation in blasts and how different it is to set a standard, it likewise shows that if 8 tons can be obtained from one pound of powder, three tons or less can hardly be considered efficient blasting.

Recently there was established the Wisconsin Limestone Company, Waukesha, Wis. The project is headed by W. S. Halladay, who has been a prominent figure in crushed stone and agricultural limestone circles in Wisconsin, having formerly been connected with the Waukesha Lime & Stone Company, Waukesha, Wis. The company is at present erecting a plant especially designed for the manufacture of agricultural limestone, and as poultry grit. The company will conduct an educational campaign on the value of limestone, having established a soils bureau for promotional purposes. Mr. Halladay's conversion to limestone is the result of personal experiments conducted on a five-acre "depleted, nonproductive, run-down piece of land adjoining the city of Waukesha."

Will Organize by States

Agstone Association Also Heard Report on Uniform Lime Law

THE National Agricultural Lime Association convened in session at Indianapolis, Ind., October 15. Chairman H. E. Bair, general manager of the France Stone Company, Toledo, O., opened the proceedings with an introductory address.

One of the matters under discussion was the reorganization of the National Association into state groups or districts, which would pay their portion of dues to the National body, and also be governed by it. The state groups will carry on their own promotional work, and all states will be on an equal footing in the National organization, irrespective of dues paid.

Mr. A. B. Meyer, president of the Mid-West Crushed Stone Quarries Co., Indianapolis, Ind., was appointed to call a meeting of the Indiana producers about the 10th of November, in order to effect formation of the Indiana branch of the National Limestone Association, while the Ohio producers will take the same step.

Mr. F. R. Kanengeiser, general manager of the Bessemer Limestone & Cement Company, Youngstown, O., who is president of the National Association, and chairman of the Uniform Lime Law Committee, opened the afternoon session, at which time he presented the report of the committee on the proposed law governing uniform agricultural lime, as follows:

"We have not had sufficient time to give consideration to the subject of a uniform agricultural lime law. In the brief period which we have had, we have written to the Pennsylvania Department of Agriculture at Harrisburg and to the Department of New York State, asking their opinion on uniform legislation in the several states in relation to this product.

"We have had favorable answers from them. We have had no specific recommendations to make for their consideration. We have spent our time today in the examination of the limestone law proposed by Elmer O. Fippin, manager of the Agricultural Department of the National Lime Association, Washington, D. C. Briefly we cannot subscribe to the law as proposed by Mr. Fippin. In detail our criticisms are as follows:

"Mr. Fippin proposes to classify materials for sweetening soil as 'Liming Materials' and sub-list them under five heads, viz., 'a,' 'b,' 'c,' 'd' and 'e.'

"The first one—'a'—Quick Lime is an absolutely specific product.

"The second one —'b'—Hydrated Lime is also an absolutely specific product.

" 'c'—Carbonate of Lime is general; may include any form of limestone, chemical by-product or other compound, having the chemical characteristics described by carbonate of lime generally, and in a commercial way describing only a by-product, inasmuch as limestone is never classified as 'Carbonate of Lime' except in a few technical discussions, and then only described as a specific limestone.

" 'd' and 'e' are descriptive of certain possible by-products.

"Mr. Fippin proposes that any material in divisions 'c,' 'd' and 'e' should be sufficiently fine to pass U. S. Standard Screen No. 3; mesh opening 0.223 with 3.6 meshes per lineal inch.

"The first paragraph covering 'Classification of Materials' cannot be subscribed to in any way whatever. It is not proposed as a law to cover standardization of materials used in liming the soil. It is a classification proposed in favor of burned lime products with a very serious effort to discredit limestone. It specifies no minimum screen through which the so-

called Carbonate of Lime shall pass. It would permit the sale of so-called Chicken Grit as a liming material. It would give no consideration whatsoever to the finely ground agricultural limestone on the market, which has proven amply in a number of different states to be a very superior form of material for correcting the soil acidity. It would wreck the whole structure of the Ohio law. It would wreck the efforts of the plants, and the business of all those fellows in the agricultural limestone business who make any effort to produce a high grade material through fine grinding and care and selection of the stone used.

"Under his law for license, no general average analyses could be offered to cover your product. Interpretation of his licensing method would almost mean that a technicality might arise wherein every shipment would almost require a license, inasmuch as analyses might vary from day to day.

"On page 5 of his law his form of guarantee says nothing whatever as to the minimum size of screen mesh through which materials must pass. As it has been recognized that the fineness of the material makes for it greater activity in soil with immediate results, and inasmuch as Hydrated Lime is a very fine powder, and burnt lime breaks up when it comes in contact with water to a very fine powder, there naturally would be no necessity for such minimum screen analyses, but recognition must be given by any law to the minimum screen analyses which hopes at any time to become a uniform law, or to be reasonably fair to manufacturers of limestone.

"Mr. Fippin proposes that the oxides of lime or magnesium alone may be offered in the analyses covering chemical content. This must be opposed by us, inasmuch as it is absolutely unfair to limestone.

"We find in this law that Hydrated Lime and Burnt Lime are mentioned very frequently. The word 'Limestone' does not seem to be in Mr. Fippin's vocabulary. We have no quarrel with Mr. Fippin on that account, but we must remember that we are asked to co-operate with the writing of a uniform lime law. Such a law, if written, must by all means be fair. Our position, as producers of agricultural limestone, is such that our product has so far outstripped hydrated lime in its popularity with state, county officials and with the farmer himself, not only because of its intrinsic worth in the soil itself, but because of the lower price at which it can be purchased, that we must jealously guard our own interests.

"Your committee has a tentative plan which recommends that if it is necessary to make an immediate statement on the uniform lime law that we recommend to any legislature, which may be considering this law, the law as written in the statutes in the state of Ohio, which is eminently fair, which was written by an association composed by both lime and limestone producers, is as good, cleancut an example of the law covering this work as can be had. We go on record as recommending this law as a standard from which any attempt at uniformity of legislation should be governed. We ask that this committee be continued. That it be given power to take action to refute any attempt to enact the law proposed by Mr. Fippin and that they be authorized to confer with Mr. Fippin, if that be necessary, so that the interests of all producers may be honestly considered. Your committee does not oppose the enactment of a uniform lime law, but we feel it must have a law which would adequately meet the needs of the limestone producer."

The conference also decided to call the annual convention to meet at some date in January, when all the state groups would affiliate with the National Agricultural Lime Association.

Precautions for Blasting in Winter

THOSE operators who continue blasting during the winter season should bear in mind that there is an extra hazard in handling and using explosives due to the vicissitudes of the weather.

It is true that many operators overcome this by not carrying on their work during the inclement months of the winter, yet it is the part of good business to start the drilling and blasting in the spring some weeks ahead of the stone production, so that there will be ample blasted material down in the quarry.

This is an excellent idea, as there can be no hold-up of the plant waiting on blasts. Thus during the latter part of winter and early spring deep blast holes can be drilled or small tunnels driven, or a combination of the two, and large economical blasts made. To do this blasting, explosives are likely to be used that have been stored during the winter, and with such explosives there is danger of premature explosion.

Consequently there is danger in handling explosives from the time that freezing first sets in during the autumn months until late in spring until freshly made dynamite is received from the factory.

Well-made, fresh dynamite is very safe to handle and use. The danger of exploding without a detonator is slight; the fact is that the liberties that can be taken with it without danger are surprising. But let it be exposed to high temperatures, or allow it to freeze and then thaw, and the best of dynamites become dangerous. It is true today that non-freezing dynamite can be purchased that will not freeze when exposed to zero temperature for some days, but the manufacturers of such powder charge a higher price for it than the ordinary powder offered for sale. It nevertheless is economical to purchase such powder for winter and early spring use.

Ordinary dynamite freezes at a temperature of about 42 degrees Fahr., some at a few degrees higher, some at a few degrees lower, while most of the dynamite begins to deteriorate at temperatures higher than 70 degrees Fahr. The ideal temperature for storing is from 60 to 70 degrees Fahr. It can be seen that dynamite that is frozen and then thawed is likely to be exposed to higher temperatures than indicated. This causes a powder that contains nitroglycerin to leak so that dangerous explosives will exude or run together so that the powder contains globules of free nitroglycerin, uncertain in disruptive force, and at the same time exceedingly dangerous to handle.

At the same time when dynamite is frozen it is difficult to detonate, so that it should never be used unless thawed. If not perfectly thawed out, there may be left mixed with rock many pieces of powder weighing several ounces, that has not been exploded, so that in the spring, after lying frozen all winter, a shovel or pick or the dipper of a steam shovel may hit this rotted powder, so that an explosion follows, injuring property and killing men.

There are many methods in use of thawing dynamite. The most common is by setting the sticks on end in front of an open fire. Another is by placing the sticks in warm water. Other methods are to put the dynamite near or under stones or boilers, or on top of boilers. Everyone of these methods is dangerous.

When dynamite is heated, the sticks should never be set on end as the nitroglycerin can run together at the lower end making it dangerous to handle. In thawing the stick should always be laid flat, and at short intervals should be given a quarter turn so as to

make the liquid parts of the powder as near stable as possible.

There is only one correct method of thawing frozen dynamite and that is by regularly built thawers, a number of which can be purchased on the open market.

Better than this is not to allow the dynamite to freeze. This means to heat the magazine. The cost of this for the amount of powder that will be carried over during the winter is excessive, so that it would be cheaper to purchase in the fall, during the winter and early spring a non-freezing dynamite.

During the winter time, above all other seasons in the year, holes should be loaded rapidly, and as much as possible wrappers should be taken off the sticks and the powder passed through the hands, so as to be sure that there are no unthawed lumps in the powder. Then too every exploder and charge should be tested before and after being placed with an electrical testing machine, so as to take no chances of holes not going off, and to see that all materials are usable.

There are many things to be kept in mind when using explosives during the winter.

Remember that dynamite congeals or freezes at about 42 degrees and must be thawed before being used.

Remember that successive thawing and freezing causes the powder to deteriorate, the acids passing off and the liquids running together, so never thaw more at one time than can actually be used.

Remember that when nitroglycerin exudes it stains the paper wrappers and soaks into the wood of the cases. Such cases when broken up or burnt can cause an explosion, so that they should not be given away but destroyed under proper supervision.

Remember that this exuding takes place more rapidly in water than in hot air, except excessive temperatures, so dynamite should never be thawed out in hot water.

Remember that stoves and boilers quickly overheat dynamite and this overheating will cause an explosion.

Remember that dynamite can easily catch fire when thawed before either an open coal or wood fire. Once in flames, enough heat can be generated to detonate the entire mass of thawing powder.

Remember that dynamite may have frozen and thawed before you purchased it, so it is necessary to find out either when it was made, or how long it has been stored.

Remember it is dangerous to open dynamite cases with bars and picks; many a man has gone to his death by doing so. Use a hard wood stick, pointed to a chisel shape on one end, and a hammer. It may be slower but it is safer.

Remember not to store fulminate of mercury caps and exploders with high explosives. Have a small building at a safe distance from the magazine for all accessories.

Remember to use more powerful exploders during the winter than the summer for it takes a higher power cap to put off chilled dynamite.

Remember not to mix two different kinds of explosives in one blast hole. One may be a low explosive and the other a high explosive, going off at different speed. It is always dangerous and seldom efficient or economical.

Remember not to carry dynamite caps in your pocket, as you may lose your pocket, if not yourself.

Remember not to break sticks of dynamite with your hands, but cut them in two with either a knife or a sharpened hard wood stick.

Remember that care and safety is better than speed and accidents.

High Prices for Cement

Production So Hampered That Leading Manufacturers See No Reduction Before 1922

From the Wall Street Journal

LOWER prices for Portland cement are not considered likely before 1922 by the larger manufacturers. President John R. Morron of Atlas Portland Cement Co. says: "I do not expect any overproduction in 1921. The possibility of a price reduction depends on the supply of coal and labor."

Labor scarcity is the chief difficulty confronting manufacturers. Cars are reported to be available in sufficient number and adequate coal is obtainable, though deliveries under contracts frequently are not being made and open market prices are much higher.

Because of these conditions some mills are operated way below capacity and have been for a year. Country's production this year is falling short of requirements by a considerable margin.

Production of cement this year is estimated at 95,000,000 barrels. In recent years production was as follows:

	Barrels		Barrels
1919	85,485,000	1915	85,914,907
1918	70,915,508	1914	88,230,170
1917	90,630,000	1913	92,097,131
1916	94,552,296		

Demand this year is unequaled in the industry's history, but owing to shortage of cars the mills have been unable to bring in their limestone and other raw materials in adequate quantities. As a result, although production in September was 10 per cent greater than in the same month last year and 45 per cent over 1918, the supply of cement ready at the mills is half what it was last year and 40 per cent of 1918 stocks.

Consequently at present prices demand is keeping up well. There is no tendency of buyers to cancel as might be expected if a price decline were foreseen. Present base prices are $2.50 a barrel, Lehigh Valley, and $2.60, Hudson River mills, against $1.75 when Government regulation ended and $2 in March. Adding $1 for sacking (refunded), 30 cents freight from Hudson, N. Y., or 58 cents from the Valley, companies generally are selling dealers at $3.90 a barrel, New York. Some manufacturers, however, have recently fixed prices at $4.09, or in one case as high as $4.59, and find they can do business at the higher prices. Retail sales are between $4.75 and $6.45.

Service Order No. 20

Its Workings Explained by Mr. Sutton of the Sand and Gravel Association

SUBSEQUENT to the issuance of Service Order No. 20 by the Interstate Commerce Commission, E. Guy Sutton, business manager, sent out from the office of the National Association of Sand and Gravel Producers the following circular to the industry:

Service Order No. 20, issued by the Interstate Commerce Commission, effective October 15, supersedes but makes no change in Service Order No. 7 as amended and extended, except to include all the territory east of the eastern boundary of the states of Montana, Wyoming, Colorado and New Mexico.

Since this order was promulgated it has been reported that some railroads have instructed their local agents to exclude open-top cars less than 38 inches in height for the movement of sand and gravel, and to refuse to furnish open-top cars even for movement in the direction of the mines. It should be clearly understood by all producers that there is nothing in Service Order No. 20 that would warrant such interpretation.

In a further effort to increase the production of coal, the Interstate Com-

merce Commission has considered it necessary to place additional restrictions on the issuance of permits to railroads authorizing them to furnish cars when to do so would be contrary to the provisions of Service Order No. 20. Applications for transportation permits are still to be handled through the Car Service Division of the American Railroad Association, Washington, D. C., in accordance with its Circular CSD-89.

It should be especially noted that the shipper must make an effort to obtain cars from the carrier before application for transportation permit is filed with the Car Service Division. If the carrier is unable to furnish cars without violating Service Order No. 20, then a statement to that effect should be secured from an authorized agent of such carrier, which should accompany the application.

The same form of blank submitted with our Circular No. 12 may be used for making application for transportation permits. An additional supply of these blanks will the furnished on request.

The Roth Building Supply Company, announces that it succeds the Sheboygan Lime Works in the retail building material business. After November 1 both companies should be addressed at 823-825 South Water Street, Sheboygan, Wis.

Loading and Screening with a Scoop Conveyor

The accompanying illustration shows a novel scoop conveyor installation at the sand pit of Somers & Sons, Wyoming, Pa.

Mr. Somers had been experiencing much trouble and expense in screening his sand and, being a resourceful man, it occurred to him that an arrangement could be made with his scoop conveyor so as to screen at the same time as loading.

The accompanying arrangement ensued. The screen was placed in the truck, being supported in the truck by a pole and on the edge of the truck by a small block of wood.

The 24-foot scoop conveyor was then placed so that the material, when discharged, would fall near the top of the screen. The screen being set at the proper angle, the large lumps rolled off out of the truck while the fines fell through.

With this arrangement Mr. Somers is loading and screening five tons of sand in seven minutes. In addition to the money saved on the loading operation, the additional revenue obtained by delivering screened sand made this an investment that soon paid for itself.

Plant of Somers & Sons, Wyoming, Pa.

Two New Lime Workers

Have Taken Positions as Heads of Departments on Association Staff

THE National Lime Association recently appointed Laurance Hart, chemical engineer, to head its construction department as manager. Mr. Hart is a graduate of the 1910 civil engineering class of Ohio State University. His engineering experience covers a wide scope, during which time he spent six years with the consulting and contracting engineering firm of Lupfer & Remick, Buffalo, the New York State Barge Canal being his principal field there, where he acquired a wide experience in the various construction and operation problems, such as surveying, mapping, estimating and bidding, purchasing of supplies, designing of concrete work, testing of materials, and superintendence of operations, also lecturing before engineering societies, college audiences and boards of trade.

L. H. Hart

A considerable period was spent by him also as manager of the Western New York office of the Hunkin-Conkey Construction Company, Cleveland. Until accepting this new position he acted as construction sales engineer in the state of Michigan, for the Lakewood Engineering Company, promoting the sale of concrete handling machinery. He, therefore, has in addition to his college training a wide practical experience in the very lines with which he will have to deal in his new position, namely, both the contractor's and the manufacturer's end of the business.

Mr. Hart is an associate member of the American Society of Civil Engineers and a member of the Engineers of Buffalo and of the Kiwanis Club.

He will gladly consult on any phase of the use of lime in building operations, from plaster and brick work to stucco and concrete.

The other new appointee is Major E. Holmes, Ph. D., who has been chosen as manager of the chemistry department. A native of the Hoosier state, he was engaged for a few years as a high school teacher. In 1908 he graduated from the University of Indiana, thereafter becoming a member of the staff of instruction of Cornell University, also doing advanced work in chemistry. In 1910 Cornell conferred upon him the A. M. degree, whereupon he took up a position as research engineer for the National Carbon Company, Cleveland, O. His researches at this place enabled him to perfect notable improvements in the dry cell. His experience in the industrial line covers practically every branch of a manufacturing plant, but principally has been in the way of technical control of factory production, development of new products and improvements of old products, the building and operation of semi-factory plants, consulting work with departmental heads, the direction of technical research, and the preparation of technical literature.

E. Holmes

Dr. Holmes returned to Cornell in 1919 for the completion of his requirements for the degree of Ph. D., and

while there he was engaged in research work of a purely scientific nature.

The services of Dr. Holmes are now open to all interested in the chemical use of lime.

Like Mr. Hart, Dr. Holmes is a member of a number of societies such as the American Chemical Society, Electrical League, the Sigma Xi Society for original research, and the Rotary Club.

Freight by Plane

A few days, when a breakdown to a road crane in the yards of the Ferguson Coal Company, Chicago, occurred, it became necessary to face a prolonged shutdown pending the arrival of the broken parts from the Locomotive Crane Company of America, Champaign, Ill. They telephoned the crane company at 3:30 o'clock in the afternoon. At their request, the crane company promised to get the

replacing parts to them that day, and although the distance from Champaign to Chicago is 135 miles, they lived up to their promise. Telephoning to Rantoul—which is not far from Champaign—they secured the use of two aeroplanes. The parts were loaded thereon, and about two hours later landed at Checkerboard Field, where they were met by a truck from the coal company.

The Lake Erie Sand & Gravel Company, Erie, Pa., has decided to incorporate, having filed papers to that effect. The capital stock is $45,000, and the incorporators are William A. Middleton, of Conneaut, O., and P. A. Deen

Better Hauling Method

Ohio Producers Show Interesting Record in Use of Motor Trucks

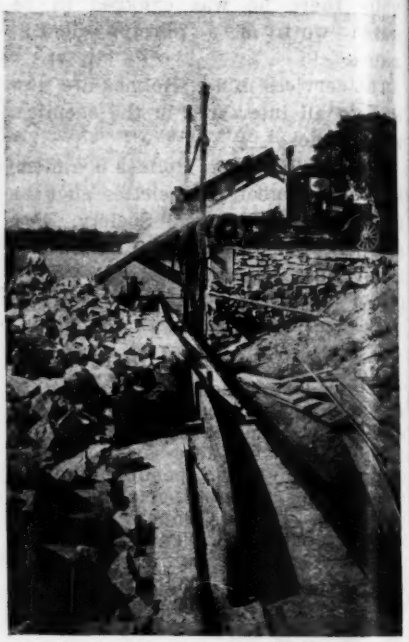
THE Buckeye State has to its credit a considerable number of quarries and crushing plants in many different lines of the stone industry. A very interesting one of these is the plant of Gottron Brothers, Fremont, Ohio, who quarry and crush their own stone, also selling other builders' supplies and coal. Their output consists of crushed stone, including a variety of sizes from 4-inch to fine dust.

They operate their own quarries, where stone is blasted out, and the handling of their materials has evolved from the use of horse-drawn carts and man-labor to mechanical equipment of the most approved types. Where formerly six horses and 18 men could haul only about 15 to 18 tons of rock per hour from the quarry to the crusher, a distance of 200 yards, now, with the employment of mechanical trucks, which are loaded both by steam shovel and portable electric conveyors, the work has been reduced to a point where with the use of one Service truck and six men they are now delivering 40 tons per hour to the crusher.

This transformation began about four years ago, when the first truck was installed with dump body and hydraulic hoist, and the success of the plan was so marked that now they operate four Service trucks, the original truck still performing service there.

After being crushed the stone is put through a graduated series of screens, separating each size—from the fine dust which is used in making concrete, to the sizes as large as 4 inches, which material is used for road work. Sepa-

Loading from bins.



Dumping rip-rap

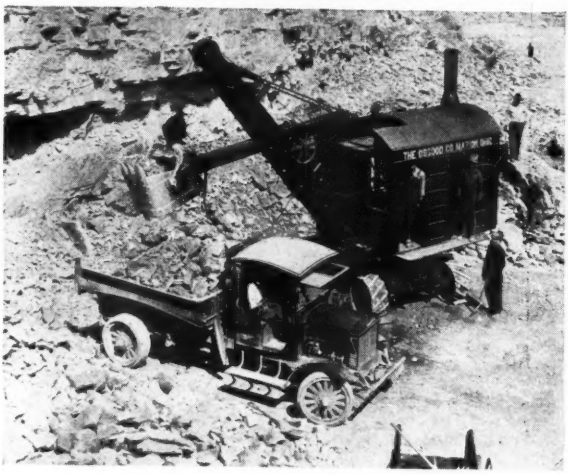
rate bins are used to receive these different sizes, the trucks being run under the bins to get their loads, the material being dropped right into the bodies of the trucks.

In hauling from the bins and quarries to the point where the stone is used by the contractor, the distance from the bottom of the quarry to the point where the trucks merge at the top is a distance of about 200 feet, which has a rise of 35 feet. Each truck must climb this grade as often as twenty times a day. Crushed stone is hauled any distance from one to thirteen miles. The combined distance traveled by these four trucks in a 10-hour day averages from 85 to 100 miles per day, while on long hauls, making only four round trips, they have made a two-weeks' average of 106 miles per day.

Gottron Brothers also have a four-year contract for hauling stone to Sandusky Bay for rip-rapping, or filling in swamp land to preserve it for duck shooting. For this purpose the stone is taken from the quarries and hauled to the river, where it is loaded on huge barges and towed about 18 miles t othe dumping ground. Each barge carries about 100 tons a trip.

Some time ago one of the trucks with a regular load went over a 30-foot embankment on the highway a little after midnight when on day and night service, and made two turnovers in rolling down the bank. There was no damage to the truck beyond a cracked running board, and in three hours the truck was again on duty. The entire expense for repairs and upkeep, including painting and general overhauling has been less than $700.

The James River Sand & Gravel Corporation, Petersburg, Va., recently incorporated with a capital of $200,000, will operate properties in this section. Robert W. Wells is president and W. W. Hines secretary.



Handling Stone by Trucks at the Plant of Gottron Brothers, Fremont, Ohio.

Big Road Job Completed on Time

K. E. Lancet, Indiana's Assistant Highway Engineer, complimented The Cunningham Construction Company because it completed an 8-mile stretch of highway on time.

The road, near Coatesville, Indiana, was 18 ft. wide, six inches thick at the shoulders and eight inches thick in center,---honestly built within both time and material specifications.

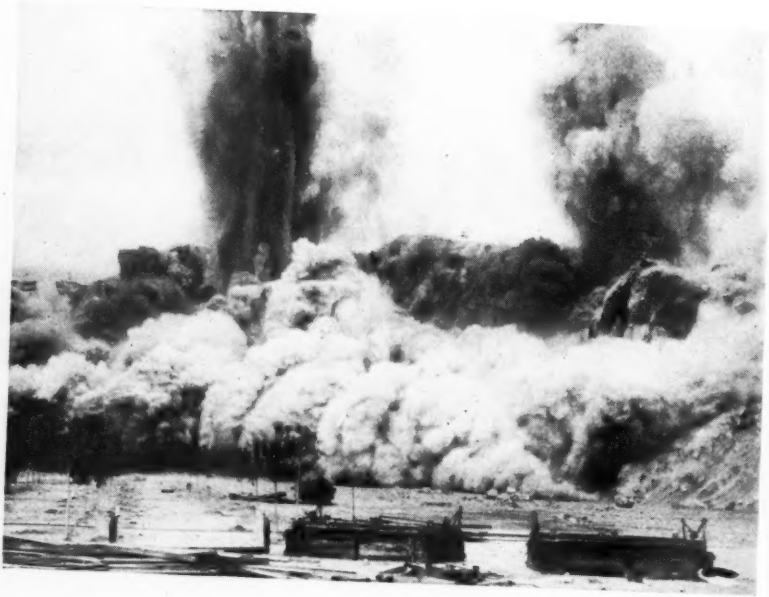
Three husky PLYMOUTH Gasoline Locomotives played a big part. They kept a hundred batch boxes constantly on the move, and the big cement ribbon crept along at the rate of 500 feet daily.

The use of PLYMOUTH Gasoline Locomotives in road construction is not only a necessity but a habit. A given stretch of highway holds just so much material, whether built in a day or year. The profit saving is in the time saving. The Plymouths keep the mixture flowing and the ribbon growing. Ask the man who bought and used.

The Fate-Root-Heath Company - Plymouth, Ohio, U. S. A.

Gasoline Locomotives

Gasoline Locomotives



Big Blast at Plant of Southwestern Portland Cement Company, El Paso, Texas

Big Blast at El Paso

Southwestern Portland Cement Company Tears Down Many Tons of Rock

ONE of the most interesting and successful quarry blasts set off in recent years was at the Southwestern Portland Cement Company's plant at El Paso, Texas, as shown on the opposite page.

In this operation 400,000 tons of rock were disintegrated and blasted down in fine condition for the steam shovel to begin its attack on the pile.

The blast was a multiple shot. For this purpose 47,000 pounds of powder was used, a battery of thirty-four 6 inch holes from 95 to 145 feet deep being bored with a No. 4 Clipper well drill. The lower 40 to 50 feet of the holes were filled with California Trojan powder of 60 per cent strength. The upper part of the holes to 17 feet of the surface were filled with 40 per cent strength of the same powder. For the detonation a Cordeau plain fuse was used.

The illustration of the rock pile after the blast shows only three-fourths of the pile.

Both powder men and quarry men pronounced this one of the most successful quarry blasts of recent years.

Some Comments on Selecting Quarry Cars

A READER has asked the question, "What should be the controlling factor in selecting a quarry car, the loading or dumping features?"

A question of this kind is difficult to answer, for each quarry has its local conditions, and the methods of loading followed must be considered, as well as how the crushers are located. Hard-and-fast rules cannot be laid down for selecting quarry cars, but there are some general comments that can be made, that may assist materially in making decisions as to general types of cars to be used.

If cars are loaded by men by hand, then the first consideration in selecting a quarry car is to have a low type of car, so that the men can load it quickly and economically. This does not mean necessarily that a certain car, and that only, can be selected; for it may be necessary to also consider the method of dumping the car and feeding the crusher. Thus these two considerations would be the ones to govern the selection of the car.

On the other hand if the cars are loaded by power—that is, by derricks, steam shovels or other machines—the height of the car is of small consideration, for it may take longer to load a low type of car than one that is higher. Then the main consideration is the method of dumping.

The size of the car should be governed by the method of hauling them and the manner of loading. If man or animal power is used to haul or push the car, a small car should be used; while if mechanical power is used for transporting, a larger size car should be employed. Naturally with mechanical power some kind of loading machinery would generally be used.

Thus the general principles that can be laid down for selecting cars are: for hand loading a small size car, not over two tons capacity, and of some low type that can be dumped to suit the crusher layout; while for machine loading, a large size car, the selection of which will be governed by the methods of dumping to suit the crusher.

The Blue Ridge Slate Corporation, Esmont, Va., has been organized with Thomas P. Gay as president, and Whiting C. Faulkner, secretary, to operate local slate properties.

Storage for Limestone and Phosphate

BY J. R. BENT

Director Phosphate and Limestone Department,
Illinois Agricultural Association

In presenting a few observations on the subject of the local storage of such bulky fertilizer materials as ground limestone and raw rock phosphate, I feel that I am touching upon the most immediately urgent mutual problem of the producer and the farmer.

In the present era of insufficient and irregular car supply and the shortage of farm labor many farmers have worked their lands without the amount of attention to soil treatment and the maintenance of fertility that would have normally been given to such important factors in successful farming. This has been a common loss—a loss to the farmer because of the decreased production for undernourished soils, and a loss of sales to the producer. We are both of us interested, then, in reducing the peak load of the seasonal demand for fertilizer, which, it has been fully demonstrated, cannot be adequately met with our present transportation system and in the distribution of production and shipment more evenly throughout the twelve months of the year.

You, as producers of fertilizer commodities, could of course provide storage at your plants to take care of a larger production and thus maintain a fairly regular and consistent curve on your production charts. But this would solve only half the problem—and the smaller half at that—leaving the matter of transportation just as serious a handicap as before.

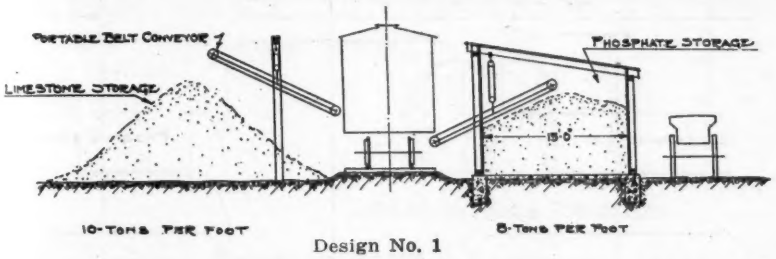
The storage of fertilizer at central points in the agricultural states has also been suggested, but this would be only a half-way solution at best, and would in many cases overload the product with charges for storage and double handling at points where the rates for this service are the highest, and would also increase the freight charges without any adequate compensation in speed of delivery.

It has also been suggested—and I believe the suggestion has at times come from fertilizer manufacturers themselves—that the logical point of storage is on the farm, where the product is to be used. An analysis of the situation, however, shows this to be practically out of the question. There are few farmers who have at their present command sufficient storage space for the fertilizer needed for any one season, neither have they facilities for handling the material efficiently or economically. If each farmer were to provide for himself such storage facilities, the cost per ton of fertilizer stored would be immensely greater than by the community plan which we recommend; and it would furthermore be obviously impossible for the farmer to accept delivery of cars of fertilizer at any time the manufacturer might see fit to ship them, and unload them immediately, so as to release the cars for other work and render unnecessary the payment of demurrage, without seriously handicapping himself in his farm work.

We believe, therefore, that the community storage idea is the most feasible, and we have worked out for use in Illinois a number of designs for storage suited to the varying needs of different communities. These may be of interest to fertilizer producers, in most cases not because they will care to enter the retail end of the business, but because movements of this kind to be successful must have encouragement and a certain amount of intelligent direction from the producers of the materials involved.

In planning such work much depends upon the storage tonnage required by the community interested, the physical conditions surrounding the location selected, and the financial resources available. Careful thought should be given to the site, and it should be borne in mind that private ground purchased for the purpose close to the railroad track is preferable in most cases to building upon the right-of-way of a railroad, for it is impossible to secure sufficiently long or absolutely fixed contracts with the railroad companies in most cases.

We believe that a storage charge of about $1.00 can be both justified and commercially sustained in case of the simpler types of storage, and perhaps as much as $1.50 in the case of the mechanically equipped or more



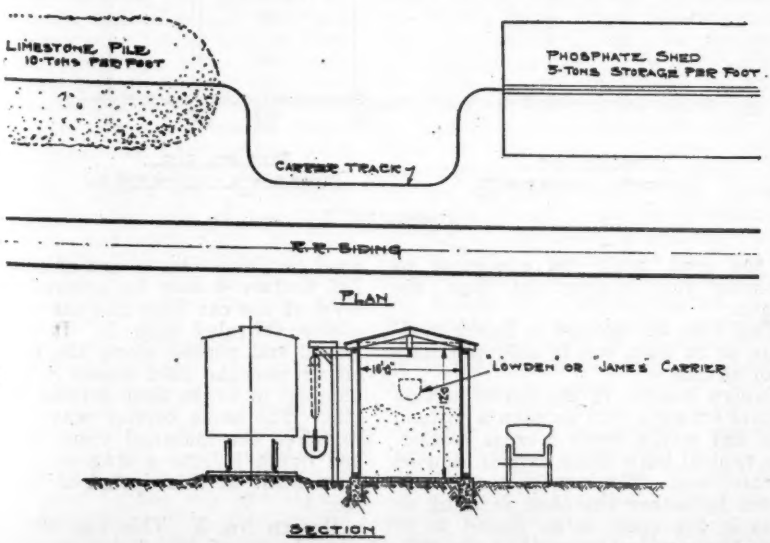
Design No. 1

expensive gravity types. The overhead costs, and the retiring of the investment within a reasonable length of time justifies these charges and the usual open market variations between the time of light demand and the time of heaviest demand, we believe, will protect this difference in price.

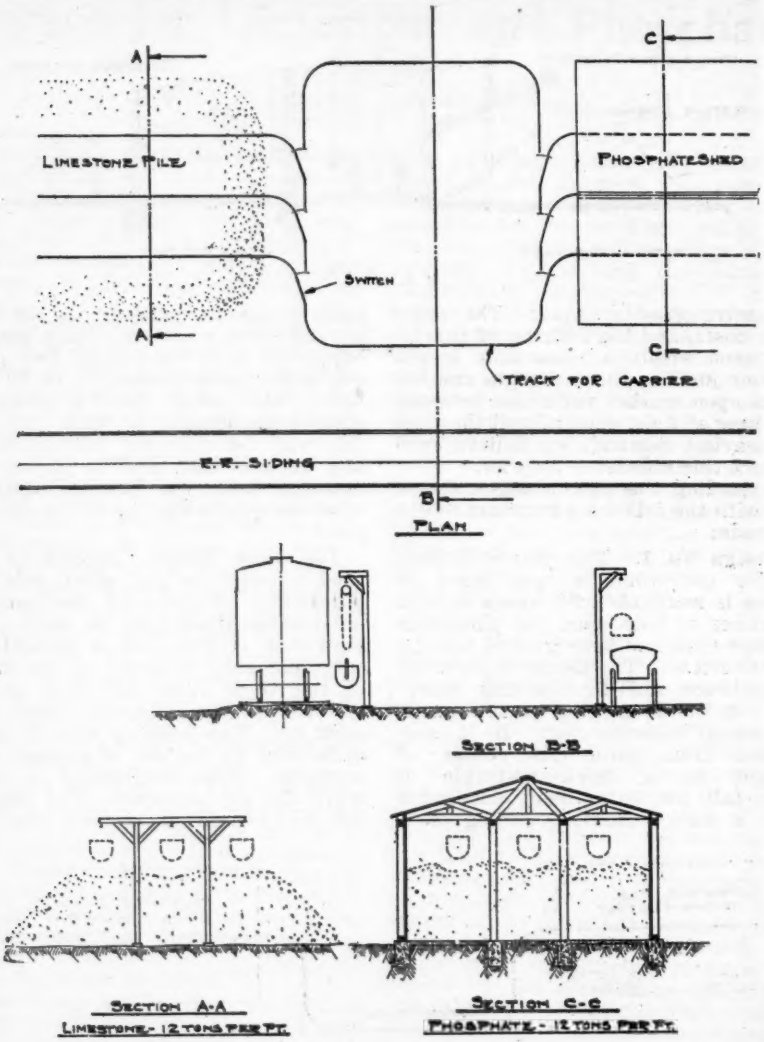
Regarding the eight designs shown herewith the following comment might be made:

Design No. 1. This plan is intended for use where a spur track or siding is available with space enough on either or both sides for phosphate storage shed and open ground storage for limestone. The design is intended to embrace semi-labor-saving equipment in the form of a portable self-contained belt-conveyor. It is suspended from about its center of weight by a block-and-tackle or chain-fall, the latter being suspended from a trolley carrier running on a cable or track overhead. On the open ground storage side this cable may be supported over the top of two poles set in the ground some 50 or 60 feet apart, the cable running down to ground anchorages at each end. In this way the conveyor may be raised and lowered, and used to convey the material from the box car door or open-car side to the top of the storage pile.

The same feature applies to the shed storage on the other side for phosphate. Instead of the cable a hay-carrier track may be used. The high side of the shed is toward the car. The shed is closed on the inside of the studs from the floor to the storage line and is opened from that point up. This opening may be made quite long by the use of trussed roof supports, thus facilitating a long travel for the conveyor. The rear of the shed is built tight from the floor



Design No. 2



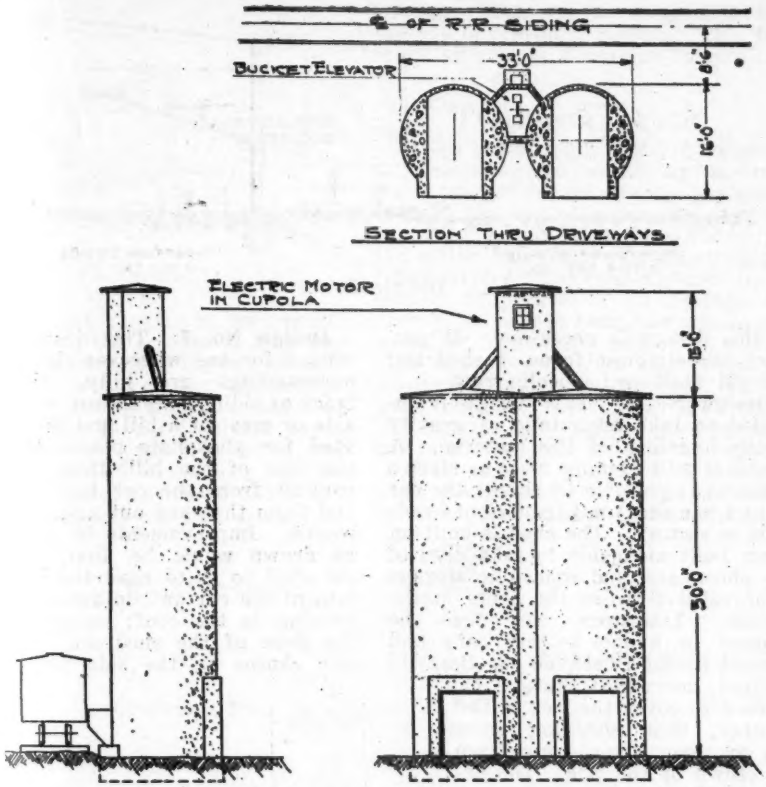
Design No. 3

to the roof, with the exception of windows for loading out into the wagon.

This type of storage is fairly moderate as to cost, but is only partially labor-saving.

Design No. 2. In the upper portion of this drawing will be seen a ground plan and in the lower a cross section. The typical barn litter carrier is used in this case. The carrier track supported by either the shed framing or poles in the open, is so placed as to bring the carrier alongside of the railroad car, where by means of its chain-fall feature it may be lowered to the level of the car floor and the material easily shoveled into it. It is then raised and pushed along the tracking either into the shed where it may be dumped, or to the open ground storage pile. The same carrier may be used to move the material from the shed and dump it into a wagon. An improvement of this design is found in No. 3.

Design No. 3. This has all of the advantages of No. 2, but is intended

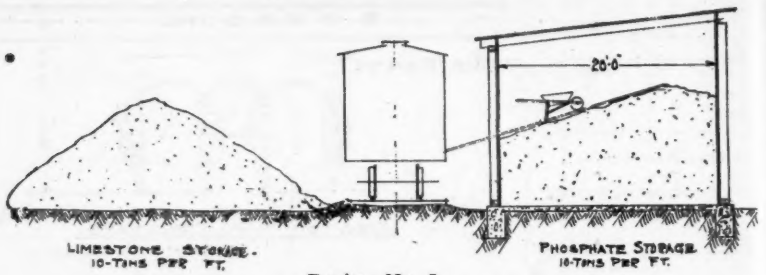


Design No. 4

for larger storage and provides an endless track with switches sufficient to take care of a larger square shed and wider limestone pile. Two carriers should be provided for this plan, so that one may always be at the railroad car side being loaded, while a boy or extra man is taking the other to the shed or storage pile and dumping it. The empty may be brought in around the far side of the track behind the load each time, so that the process may be continuous.

Design No. 4. This is the well-known Kankakee concrete silo and bucket-elevator type. Kankakee county is quite thoroughly and successfully equipped with this type of elevators and storage bins. The material is shoveled from the car into a removable chute which discharges into the boot of the bucket elevator in a similar manner to grain elevators. It is carried to the top and is discharged into the top of the bins, which, it will be noted, have raised floors with driveways underneath. The floors have hopper openings, so that the material may be dropped directly into a wagon. In some cases these driveways are open at both ends and in such cases they should be provided with a sliding door to shut off the draft through while the material is being handled. It is recommended that the motor power be placed in the head-frame at the top of the elevator instead of at the bottom. This lessens the loss in friction and also in wear, and places the motor in a safer position with reference to mischievous meddling. The silo bins may be constructed of either monolithic concrete or concrete staves, but in either case should be sufficiently reinforced. It is important that a good foundation on ground that is not of a settling nature be provided. This type of storage has proved very satisfactory, but it is of course expensive.

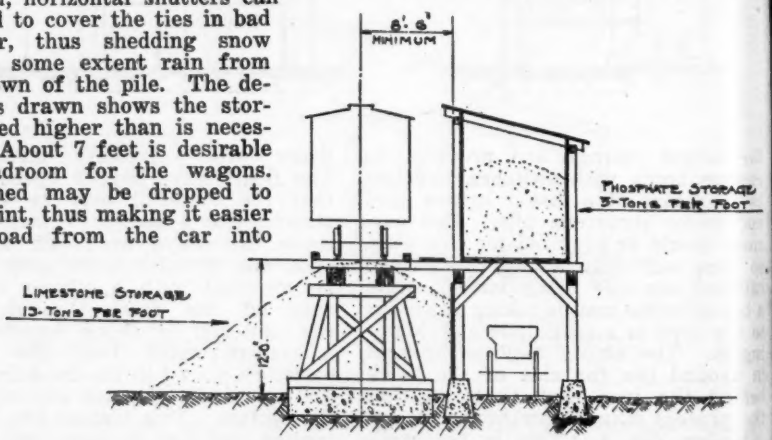
Design No. 5. Little explanation



Design No. 5

of this design is necessary. It provides the simplest form of shed and the old fashioned wheelbarrow.

Design No. 6. This design is intended to take advantage of gravity in the handling of the material. A trestle is built running up at as steep a grade as is possible to handle the car (3 to 4 per cent) until sufficient headroom is secured. The shed is built on bents built alongside to take care of the phosphate, and limestone storage is provided between the bents in the trestle. Limestone can thus be shipped in hopper-bottom cars and dumped through between the ties. If desired, horizontal shutters can be used to cover the ties in bad weather, thus shedding snow and to some extent rain from the crown of the pile. The design as drawn shows the storage shed higher than is necessary. About 7 feet is desirable as headroom for the wagons. The shed may be dropped to this point, thus making it easier to unload from the car into the shed. Hopper openings may be provided in the floor of the shed, which will discharge the phosphate into the wagon.

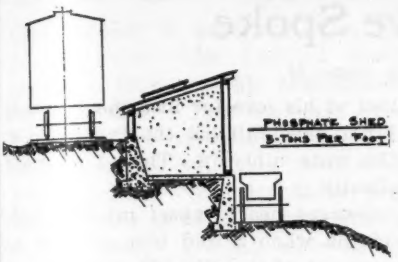


Design No. 6

Wherever there is a grade in the main railroad track, advantage should be taken of it by running the trestle up in the opposite direction, thus securing the necessary head-room in less distance.

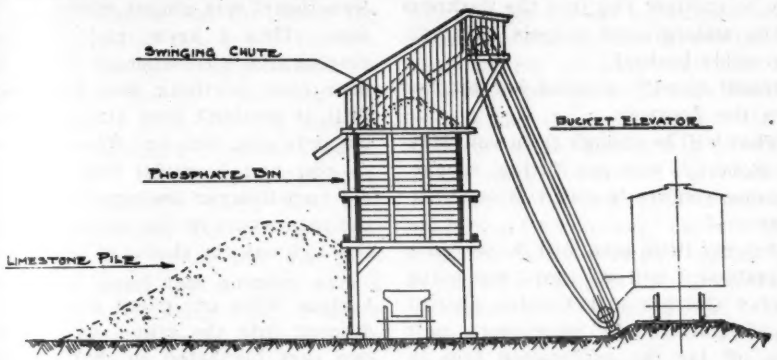
Design No. 7. This design is intended for use wherever the railroad surroundings are hilly. The spur track or siding may be run around the side or crest of a hill and the storage shed for phosphate placed lower on the side of the hill, thus providing gravity from the car into the shed and from the shed out again into the wagon. Improvements in the design as drawn would be, first, reversing the shed so as to have the high side toward the car and do away with the opening in the roof; second, sloping the floor of the shed and installing side chutes on the side toward the wagon, so as to provide gravity discharge from the shed into the wagon. Open-air limestone storage may be provided in connection herewith by extending the track beyond the shed and throwing the limestone off on the hill side between the track and the wagon road.

Design No. 8. This is a frame gravity, mechanically equipped stor-



Design No. 7

age plant very similar in its provisions to No. 4, but smaller in size and of frame construction instead of concrete. The cost per ton of storage space is greater than No. 4, but this is largely due to the fact that there is less storage provided, while the same amount of machinery is required. In all cases where about 200 tons of storage is all that is needed, this would probably be preferable to a smaller edition of the Kankakee type. The by-pass feature of the chute over the bin should be noted. Material may be either dropped into the bin or sent on across to an open storage pile.



Design No. 8

The Link-Belt Company, 910 S. Michigan Ave., Chicago, Ill., recently published an illustrated and very attractive 24-page book covering their Traveling Water Screens. This publication will be sent to anyone interested in the effective and economical screening of condensing water. Surface condensers are easily clogged up by trash contained in the water supply, and very hard to clean. Clogged condenser tubes mean reduced efficiency of operation and other disadvantages that can be forestalled by the use of traveling screens. This interesting subject is covered fully.

Testing a Truck

At the Indianapolis Motor Speedway on September 30 a Duplex limited truck completed a remarkable performance, in the way of a non-stop 24-hour run around the speedway, without interruption for either gas, oil, tires, or relief drivers. The total distance traveled is 935 miles, or an average of over 38 miles per hour, the minimum speed at any time being 35 miles. Fuel was supplied from four drums of gasoline mounted in the body, which were connected right to the carburetor. The regular gas tank was used for oil, the lead from this tank being tapped into the engine filler. The drivers were given food on the run, to do away with the human necessity for a stop. The load carried consisted of gasoline, oil and ballast with a total weight of 8,300 pounds, exclusive of drivers. The surface of the speedway was rough, like the majority of roads over which trucks are operated, including a temporary 14-foot wooden bridge. The original set of tires made the entire trip.

This performance evidences the possibilities of the modern high-speed pneumatic-tired truck as a vehicle for modern transportation.

The Sand & Supply Company, Winston-Salem, N. C., has been incorporated with a capital of $50,000 to operate sand and gravel properties in this district. Howard W. and M. W. Gano and E. K. Hahn are the incorporators.

When Love Spoke

(Continued from page 55)

rich he was to have such a daughter! For an instant my thoughts traveled to the little mound where the lilacs grew, and of the time when the blueness went out of my summer's sky, for my love was like Eveline.

"Come back here!" I called huskily.

She obeyed my summons, rather timidly, thinking perhaps that I had changed my mind, but an idea had at once occurred to me and my heart was laughing silently.

"Listen," said I very seriously, when Eveline was perched on her father's knee. "I'm too old to be your escort into the mine, but I'll get one of my boys to conduct you into the darkness of the underground tunnels. He will be terribly bashful."

"Good! Good!" shouted her brother from the doorway.

"That will be enough from you, Master Robert," was my fitting rebuke, "because you are to escort Miss Sweetheart——"

That my little plan will be perfectly understood, I will say that I was going to play Georges and Eveline against Master Robert and Sweetheart, pair them off for the exploration trip in the mine. Oh, yes; I had a purpose in this, a design, if you please, to help Cupid do his work. Not that the love messenger needs any assistance, but on some occasions a helping hand from one whose heart is still young may come in with the final touch to hasten out the inevitable. I counted on Georges being very miserable when he saw Sweetheart in Robert's company, and as for Sweetheart when she would know that Georges was to be with Eveline, Oh, I didn't try to surmise the outcome, but my heart was light as I made the necessary preparations. If I could bring Georges to the front where his bashfulness and timidity would be overcome in a declaration of his love for Sweetheart, would I not have fulfilled the injunction of "Do unto others"? Thus I reasoned silently.

Georges nearly upset my fine little scheme when I told him of it as he came out of the pit. He refused to go into the mine until I assured him that Sweetheart was to be in the party. Ah, that made a world of difference. Only one girl for Georges. Of course, I didn't tell him that he was to escort Eveline. Oh, no! He thought that would be my pleasure. It was cruel to torment the poor fellow. His seriousness was genuine. His love for Sweetheart was almost written on his face. Thus I knew, and yet I was playing him a treacherous trick. Was man ever anything else than false! Still, it wouldn't hurt him, you know, but only spur him on. Their love was so real and beautiful that even if I did hurt Georges' feelings, I knew that the pain would be the necessary incentive to break the chains of bashfulness.

The evening star hung low on the horizon when our party was ready to descend into the mine. Georges had two cars blanketed so that the lime dust would not soil Eveline's and Sweetheart's dresses. The reverence that he showed them! He stood proudly waiting as a cavalier of old to take his lady love into the spooky darkness of the entry. His dust-spotted overalls set off his stalwart body in the finest possible manner. Miss Eveline looked at him more than once. She did it slyly, of course, but the eyes of "Mister Tom" were watchful. Of this admiration Georges was totally ignorant. He, as usual, could only see Sweetheart. She was certainly worthy of his bashful adoration.

When I announced that Sweetheart and Robert should get into the first car and that I would "wildcat" it

down myself, I kept my eyes on Georges' face. The hurt of death seemed to flash over his countenance for an instant. Into his dark eyes there came the same expression that a faithful animal will give its master when reproved. The joy faded into blank despair as he gazed speechlessly at Sweetheart. I could see— and I smiled surreptitiously—that the blackness of the pit was in his soul. How his fiery blood must have flamed at "Mister Tom!" With other men, a thing of this sort would never have been possible, but with Georges I knew the mainspring had been touched. He would fight for Sweetheart and I admired him.

While I was hunting a hand-sprague to use in holding the car down the long, dark incline that led to the bottom of the limepit, I saw Sweetheart climbing into the car. The next second I heard a high, piercing scream. It was Sweetheart's frightened voice. Looking up I beheld an awful spectacle. Sweetheart's white face was silhouetted sharply against the opening of the dark mine. She was moving. My dazed eyes were almost blinded by a clutching fear. The car with Sweetheart in it was speeding into the open entryway, unchecked, liberated and free. In some manner the block must have fallen away from the wheels or else Georges had failed to secure it properly. In a flash, her white face was gone, swallowed up in the blackness, her appealing hands outreached to her lover to whom she turned in her hour of peril.

"Ma Cherie!"

Georges' hoarse exclamation rang out upon the awful stillness of the starlight. In my long experience of mining I have been close to death many times and I know what it means to think that this is the end, but never have I experienced the cold chill of fear as I did when Sweetheart's runaway car dashed into the perils of the underground. Ahead of her stretched at least a half mile of down grade that would hurtle the car into a greater speed the longer it kept on the shining rails. Then there were treacherous curves around outjutting pillars where the car could flatten out. Sweetheart was in it and, dazed as I was, the scene came to me with startling vividness. "Fool! fool!" cried an accusing voice in my brain. "It's your fault." It was. I had planned the trip to make Georges break his silence in a spell of jealousy, if this were possible, and now Sweetheart's white face and trembling lips spoke to me accusingly.

Yet all these thoughts were but of a second's duration. Sweeetheart's cry and Georges' answer were almost simultaneous. With all the wonderful elasticity of his splendid muscular body in action, Georges kicked the block out from under the first wheel of the second car as he leaped into it with a flying start. Powerful was his shove that set the car into rapid motion after Sweetheart's runaway, nevertheless I caught it after a mighty sprint as it began its wild flight into the midnight darkness of the underground. Ahead of me crouched Georges. Playing the strong carbide lamp like an illuminating searchlight in the dense, opaque shadows that had us enmeshed, Georges watched intently. The wind that our car was making swirled around our faces, particles of limestone bit our cheeks, the underground tunnels roared from the impetuousness of the car's speed; drumming echoes sounded in a mighty booming as we drove ahead faster, faster and still faster, gliding over the smooth, shining rails with a demon's speed.

"Go! Go!" shouted Georges.

He called to the runaway car to increase its velocity in endearing words. His shout of encouragement vibrated in hollow muffled echoes over the roar. "Sweetheart's ahead! Run! Run!"

he pleaded, leaning over the drawbar.

As if obeying, the car dashed downward. On a long, sloping curve, I could feel the side of the car lifting upward and I thought we would be catapulted against the hard limestone rib. For a space of time in which I did not breathe we hung in the air. Gradually I sensed that the car had righted itself on the track. Thankfulness swelled in my heart. On we plunged until the curve had been passed, and when the wheels hit the straight downward track again Georges shouted with soul-gladness.

"Look, 'Mister Tom,' look!"

The light from his lamp shone ahead into the darkness, but outside of the yellow illumination that speared the round concaved heading I saw a white speck. It appeared only for an instant like a star's brief twinkle before it was gone in the dungeon hue of midnight. Therefore I knew the cause of Georges' gladness. The speck was Sweetheart's white waist disappearing behind an outreaching wall of limestone. Her car was sticking to the track and a miracle was happening. Ordinarily the cars would spill on the first curve when beyond human control, but by the glimpse of the whiteness in the inky shadows she was ahead, driving onward toward the bottom at a terrible pace. At that, we were gaining. Our car had traveled a bit faster or we would not have seen her.

With a swish and a violent lurch we swung around the bend in the heading that Sweetheart has just passed. Oh, the pace! We fairly flew through the round opening that led into the heart of the mountain.

"Ma Cherie!" called Georges. "Ma Cherie; Sweetheart!"

There she was within the radius of the lamp's glow. She saw us. Her voice came through the roar of the speeding cars.

"Georges! Georges!"

Her hands were outstretched; her face, white as chalk, stood out vividly against the dark background. Georges leaned forward and I had to grip his coat tightly to keep him from falling under the wheels. He wanted to spring out of our car and run to Sweetheart. Ah, if it only had been possible! If any human endeavor could have bridged the space that separated Sweetheart from us, we would have made the attempt; but she was going as fast as we were. The gap remained unchanged. The shining pair of rails gave back a golden glow from Georges' lamp and in their radiance I read the ordeal that he was suffering. Great beads of sweat stood out on his blood-flushed face and his fingers cramped over the iron crossbar with the grip of a soul in torment. My heart was sad beyond description for Georges and Sweetheart, as the end must come soon. Splendid youth, in the springtime of happiness to be crashed into——. My head reeled with the realization that we were nearing the bottom of the slope. How was the switch turned? If it remained unchanged we would crash into the heavy loaded cars standing on the main of the sidetrack. If any changing of cars had taken place since the last trip had been pulled out, there would be a slim chance of our speeding up the empty road where the up-grade began. Hope held out a slender ray of encouragemnet as onward we plunged. The gray heading pillars stood as shrouded specters in the fleeting lamplight as we sped wildly forward. Right ahead was Sweetheart's car. She had sunk out of our sight. No doubt she had fainted and was lying insensible on the bottom of the car. For this fact I was thankful. It might save her at the sidetrack landing if the switch was thrown for the empty track. The lurch would be great, violent and sharp, and if the wheels stuck to the rails she would not be thrown out.

"She's gone!" cried Georges, leaning out a bit farther while peering into

the darkness for the girl he loved. Then it came to me that Georges would be injured unless——

I grasped him and pulled him to the bottom of the car. Man, how he fought! His reason was touched with despair. He knew not what he was doing. For a while I held him, for I, too, have been a powerful man. But he wore me out quickly. He was raising me off of his body with his muscular arms when the car struck the landing. The sudden jolt dashed me against the side of the car and darkness overpowered me completely.

In the midnight stillness I opened my eyes. My head was almost bursting and my body was full of torturing pains. The dark, hollow sounds of stony solitude remained undisturbed. A drop of water splashed on my burning face from a crevice in the roof. Its coolness revived me. The runaway, the race, Sweetheart and Georges, the switch, all came to me vividly. Staggering, I got to my feet and with my pain-blurred eyes I dimly saw a faint gleam at the upper end of the sidetrack. Could that be Sweetheart and Georges? Were they safe? Groping in the intangible darkness I found the switch. Gladness surged through me. It was thrown to the empty road. The cars had raced on unchecked and I had been flung out against the limestone rig when Georges lifted me off of his body while I was trying to hold him from being ground under the wheels. Dragging myself on my hands and knees, I worked my painful way toward the light. My advance was slow. Gradually I drew near. The shade of the lamp was turned away from me and, therefore, I could see Georges and Sweetheart in the bright illumination. The yellow rays enshrouded them with love's benediction as they were locked in a fond embrace.

"I love you," said Georges fervently.

Very gently I took the lamp and turned its gleams away from them, because Love was speaking.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trademark attorney, Continental Trust building, Washington, D. C., at the rate of 20 cents each. State number of patent and name of inventor when ordering.

1,353,908. Tunneling machine. Carl W. Hodgson, Denver, Colo.

1,353,913. Power excavator. Richard C. Keogan, South Bend, Ind.

1,354,077. Crushing and pulverizing machine. Nathaniel A. Stratton, Boston, Mass.

1,354,226. Apparatus for storing coal, ore, and other materials. Francis L. Stuart, Washington, D. C., assignor to International Conveyor Corporation, New York, N. Y.

1,354,831. Mining machine. Robert H. Jeffrey, Columbus, Ohio, assignor to Jeffrey Manufacturing Company, same place.

1,354,855. Rock crusher. John G. Simpson, Knoxville, Tenn.

1,354,870. Shovel excavator and operating means therefor. Theodor C. Arpe, Portland, Ore.

In the vicinity of Rising Springs, Pa., the Cambria Steel Company, Johnstown, Pa., is planning for the erection of a new stone crushing plant. Plans for the structure have been prepared.

Representatives of the John F. Byers Machine Company, Ravenna, Ohio, held their third annual sales conference and convention at Glen Crest Hotel, Ravenna, October 11 and 13. There was a full attendance, with the exception of the Los Angeles and San Francisco representation. Important questions were discussed and plans for 1921 were outlined. This company's business is on a steady increase and they are at present carrying out building extensions to meet the demands for their Auto-Crane.

Erie, Pa., lost one of its prominent citizens on September 30, in the person of Chas. B. Lechner, who for many years has been connected with the Erie Sand & Gravel Company. Mr. Lechner was 68 years of age. He is survived by six children and one sister.

Business Sure to Come

Generally Hopeful Attitude Among Eastern Producers

By Our New York Correspondent

A "VALLEY period" is existing in building construction circles in the eastern metropolitan districts and the past few weeks have shown a decided sameness in the trend of affairs. Despite the lessened call for materials, there is a noticeable stability in price quotations of important commodities, and sand, gravel and crushed stone, with kindred specialties, are holding their own in this respect.

The general attitude of producers and dealers is one of a hopeful nature, based on anticipated business that is bound to come, but just when, is now a matter of guesswork. The open season and continuance of road construction make for one of the "bright spots" in the situation, and crushed stone operators are enjoying a fairly good call from this quarter in certain sections. The fine weather is also encouraging production, and regardless of the fact that stocks have reached a "comfortable" status, no few plants are continuing operations. Labor, as is to be expected, has shown a great change in matter of available supply and few producers are experiencing any difficulty in this direction.

With constant improvement in transportation, producers up to a very recent date were hopeful that their troubles were over on this score, but the order of the Interstate Commerce Commission, effective October 10, barring different materials from the free use of open cars, has given a "set back" that is meeting with keen protests. All classes of building commodities are affected, so that with any sort of resumption of construction on a good scale, scarcity and higher prices are pretty sure to occur. The ruling of the commission has been made to assist the movement of coal to the west.

The investigation of building material prices at New York has not as yet touched sand, crushed stone or gravel, and no particular inferences have been drawn regarding a "price combine" of these commodities as in the case of other materials. Two investigations are under way, one by the district attorney, under the direction of Attorney General Palmer, and the other by the special Senate Committee, headed by State Senator Lockwood. The hearings of the latter up to the present time have been directed towards contractors and labor union leaders. The United States Special Senate Committee on Production and Reconstruction, headed by Senator William M. Calder, has also been holding sessions in New York for some weeks past.

Prices of sand, gravel and crushed stone remain substantially at the figures as set forth in the last issue of PIT AND QUARRY. Sand is selling for $1.50 per cubic yard wholesale in cargo lots, an advance of 25 cents over prevailing quotations at this time last year; dealers are asking about $2.75 per yard for the material, delivered. Gravel holds at $3.00 per cubic yard wholesale, both for ¾ and 1½-inch sizes, while dealers are receiving about $4.25 for first grade material "on the job." Crushed stone is being turned at $1.90 and $2.00 per cubic yard in cargo lots, as against a $1.75 figure of a year ago for this same size, 1½-inch, while ¾-inch stock is selling at $2.15 in cargo shipments, as compared with $1.85 in the fall of 1919. Retail, the material is quoted at $4.00 per cubic yard delivered in Manhattan or Bronx boroughs. Cement is firm at $5.10 a barrel at the dealer's yard, delivered to job site, while common lime is $5.20 per 300-pound barrel.

The Cambrian Slate Company, Gran-

ville, N. Y., has been formed with a capital of $25,000 to operate properties in this district. The company is headed by R. T. Lloyd, E. R. Evans and D. O. Roberts, all of Granville.

The Colonial Sand & Stone Co., 650 West Forty-ninth Street, New York, has completed plans for the erection of a two-story service and garage building on Fiftieth Street, for company cars, to cost about $35,000.

General Appraiser McClelland, Customs Department, Port of New York, has handed down a decision upholding the Collector's assessment of 50 cents per cubic foot on "blocks of Tavernelle stone," as set forth under paragraph No. 97 in the Tariff Act. The importers, F. H. Shallus & Co., Baltimore, claimed duty at the rate of but 3 cents per cubic foot under paragraph 99.

The Great Eastern Gravel Corporation, Buffalo, N. Y., has been incorporated with a capital of $1,500,000 to operate sand and gravel properties in this district. The incorporators are G. D. Perry, G. A. Keating and G. K. Mantz, Buffalo.

Sand dredging operations on the New Jersey side of the Delaware River have developed a new source of revenue for the state. In accordance with recent agreements signed with five dredging companies engaging in this district, the state will receive 2 cents per cubic yard for all material dredged; a check was recently turned in for $8,784.92 for the first 12 months operation under the plan, and it is estimated that the present year, dating from October, 1920, to September, 1921, inclusive, will net a round $12,000 from this source. The Department of Commerce and Navigation is not supervising the dredging, trusting the companies to make the right return, if any question on this point arises; however, recourse will be had to the federal records showing the quantity of sand taken from the river.

Sand producers, shippers, as well as highway contractors, backed by the New Jersey State Highway Commission, have filed a protest with the Board of Public Utility Commissioners against the present rates charged for the transportation of road-building materials, including particularly sand, gravel and broken stone; the rates at issue were those as permitted by the Interstate Commerce Commission. In the adjustment of rates for sand, it is set forth that the Commission allowed an increase of 20 cents per ton, instead of a flat increase of 25 per cent; this, it is held, has resulted in an increase of more than 25 per cent on short hauls and less than this amount on long hauls. It is contended that the increased rates dealing primarily with the matter of sand, will restrict shipments and encourage the development of local sand pits.

Cement mills in the Lehigh Valley district of Pennsylvania report increasing activities during recent weeks and a number of the plants are now working on a day and night shift basis. The Atlas Portland Cement Company, Northampton, Pa., is operating at good capacity at its local No. 2 mill; up to around the middle of September, this plant had been idle for a considerable period, and is now "hitting its gait" in encouraging fashion. The Lehigh Portland Cement Company, Chapman's, and the branch mill at West Coplay, are now producing on the day and night basis. A heavy tonnage is leaving this plant and with present good supply of railroad cars there is little or no opportunity to accumulate a reserve stock. To facilitate production, a number of mills in this district are now packing the bags direct from the cement grinder. The coal supply is good and the only drawback to larger output at some of the plants is the scarcity of good labor. At Coplay, the Coplay Cement Company will build a foundry at its plant

for necessary mechanical work, including repair and parts manufacture.

Producers in the Pittsburgh, Pa., district are active. The Rodgers Sand Company is bringing large loads of sand and gravel from its Ambridge workings, and the "Twilight" is one of the active vessels of this company's fleet. The Keystone Sand & Supply Company is also busy with its river operations, and has its boat "Victory" engaging heavily in the sand trade, particularly in the Corapolis section. This company is also doing a good business in gravel.

Deputy Attorney General George R. Hull, Pennsylvania, has submitted an opinion to Secretary of State Cyrus E. Woods in the matter of granting charters to companies seeking the right to mine, quarry, excavate and bore for limestone, coal, stone, etc., holding that such a charter should be refused on the ground that a "plurality of purposes" is shown. In the opinion, it is pointed out that if the certificate applied for be granted, such a corporation could conduct a limestone quarry, coal mining business, cement business, etc., most of which would not, in any way, be connected with the others.

Ever-Clean Screen

The illustration below shows the production of sand and gravel for road work by John Cole, Sunfield, Mich.

In this particular development, it was found necessary to use a local deposit, as cars could not be secured to ship in material from a stationary commercial plant. A portable plant was therefore used, known as the "Ever-Clean," made by the Beach Manufacturing Company, Charlotte, Mich.

This outfit takes its name from the peculiar type of screen with which it is equipped, being of such a nature that it will handle wet, sticky material. This screen is made from high-carbon, perforated plates that overlap and are hinged at upper edge to two sprocket chains. As the gravel slides down the screen, the screen itself gradually travels upward, and any material that is too sticky to slide down the screen is carried up to the top and when the plates pass over the sprocket wheel., the screen plate tips bottom side up and strikes a spring bumper.

The power consists of a 6-horsepower Ideal gasoline engine, and a similar engine is also employed to operate the drum carrying the scraper by which delivery is made to the elevator which feeds the screen.

Getting out road gravel in Michigan

Road Work in Legal Mess

California Activities Waiting on Decision of the Courts

By Our San Francisco Correspondent

COAST conditions in the rock, gravel and sand business are fairly active considering the fact that the California Highway Commission has been hampered in road construction by a suit brought by W. R. Ellis, formerly secretary of the commission, tying up Federal government funds for aid in highway construction.

This suit brought by Ellis has recently been decided in favor of the commission by the Appellate court and appeal has been taken to the Supreme Court. A verdict is expected shortly which may enable the commission to do considerable road building.

A decision of the utmost importance to pit and quarry men and all connected with the gravel and rock industry in the west is the recent approval of the California Supreme Court of the contract between the city of San Francisco and the Construction Company of North America for the construction of nine miles of the Hetch-Hetchy tunnel, on a cost-plus-fee basis.

If an adverse decision had been rendered on this contract, it would have precluded about eight million dollars worth of work. It is the first contract of its kind let by any municipality in the West, and many inquiries have been made for copies of the contract, and briefs necessary for its completion.

One million square feet of paving to be laid in the town of Gustine, Merced county, California, will be 3 inches of asphaltic concrete base with 2 inches of Warrenite for wearing surface.

Plans are being made for construction of the Don Pedro dam and power house to be located on the Tuolumne river, six miles east of La Grange. It is to be built jointly by the Modesto Irrigation district for which Percy F. Jones is chief engineer, and the Turlock Irrigation district, of which R. V. Meikle is chief engineer and A. J. Wiley, Boise, Idaho, is consulting engineer. The dam is to be of reinforced concrete, 280 feet high, 900 feet long on top and 180 feet long at the base. The work involves 300,000 cubic yards of concrete. The estimated cost is $4,000,000. Bids will be called for December 1.

J. W. Riley, sales manager for the newly formed Coast Rock and Gravel Co., is arranging several big deals for his firm. The new concern is a merger of the California Building Material Co., the Natomas Company of California, and the Granite Rock Co. Mr. Riley has a copy of PIT AND QUARRY on his desk at all times and declares he gets much valuable information from its pages.

Articles of incorporation have been filed for the Grant Rock and Gravel Co., at Fresno, Cal. The corporation is capitalized at $50,000 with the following incorporators: A. R. Kerstetter, G. L. Allen, M. I. Tackaberry, K. W. Kerstetter, all of Fresno and J. D. Grant of San Francisco.

At the third annual convention of the Granite Manufacturers Association of California, held in Los Angeles, October 6 and 7, the following officers were elected for the ensuing year: John D. McGilvray, president; P. D. Mullany, first vice-president; Fred Brittain, second vice-president; E. A. Weisenberger, secretary and Max Roth, treasurer. The next annual meeting will be held in San Francisco, August, 1921.

A new company is the Caledonia Sand Company, Racine, Wis. The interested parties are J. C. Wemmert, P. J. Frederickson and C. A. Erickson. Capital stock is $6,000.

What of 1921 Prospects?

Review of Present Conditions in Buffalo as Seen by Men in Our Industry

By Our Buffalo Correspondent.

BUSINESS in building materials is looking up just now in the Buffalo district and leading builders and men interested in the furnishing of sand and gravel and kindred building supplies are optimistic for present conditions to continue for the balance of the year, it has been learned by the PIT AND QUARRY correspondent.

As to prospects for next year, generally optimistic opinions are expressed, although no boom in building is looked for until financial conditions improve as to terms of loans and until there is a drop in prices of materials.

"Altogether I look for a prosperous year for 1921," said R. W. Eberly, general manager of the Buffalo Gravel Corporation, when interviewed. "While there is at present a general slump in building operations throughout the country, conditions here are looking brighter and we expect the brighter aspect to hold the remainder of the year and to open up bright next spring. As to the wide-spread slump, I believe that it but temporary and I also think the business will be more stable and steady next year than it has been for the past year or two, or three.

"It is likely that there will be no general boom in home building until the prices of materials come down, although Buffalo, like all other cities, needs many new homes and needs them badly. Added to the cost of materials, now very high, there is the fact that the banks, which have been tightening up on loans for the past two or three years are now very tight indeed. Many, both in a business way and for homes, wish to build and have their plans all laid but are awaiting a drop in the cost of materials, which they believe will come in time, as well as more liberal financial assistance.

"Banks are very slow to loan money on building projects just now. At the best they will only allow 10 per cent of the cost in a loan, whereas a few years ago they would have advanced as high as 40 per cent on the cost of the building project. Even at the 10 per cent of cost rate they are not at all anxious to make loans."

Buffalo sand and gravel heads estimate that at present they are running an 85-per-cent-of-normal force although for a time back business has been dull and a lower percentage of their normal forces have been working.

Conditions in the cement market are loosening up considerably and at present local contractors are able to get practically what they need in most cases and at all times far more readily than a few weeks ago. Importation of cement from Canadian plants has practically ceased, although a month or two ago much was being thus imported at an added cost equal to the duty and extra transportation, the price at the Canadian factories being about the same as at American plants, when such plants had any to furnish. At no time were the factories across the border unable to furnish cement.

The reasons for the American plants now being able to supply more nearly a normal supply is in one way accounted for by the general building slump throughout the country, thus cutting down the demand to meet the growing supply. The financial tightening, causing less building, also indirectly is another cause. In some cases cement plants which were earlier unable to get coal to run their plants to capacity are getting more coal and altogether many things have contributed to the increased supply of cement.

Another factor which is holding back building, aside from financial tightening and high prices of materials, has been labor. Labor prices have been high as well as those of materials and loans. Also much of it has been rather unsatisfactory.

Building men generally concede now that the quality of labor has greatly improved during recent months as well as the quantity. It is believed for one thing that, with many men being laid off at various centers throughout the country, men are beginning to value their jobs more and to be willing to work more conscientiously to hold them. With a probably cold and a certainly long winter ahead, men, especially those with families, are thinking of making solid on their jobs.

"We are getting a better grade of labor at present and we are getting better results," said an official of a builders' supply company when talked with today. "Both our labor and its results are more generally satisfactory. The men themselves are more contented and satisfied. One reason may be the wages, which in many branches of the industry here have increased 20 per cent during the past few months. Also, there is an apparent lull in the business of building and that may have its psychological effect in making the men more anxious to do satisfactory work that there may be no danger of their being laid off. Along with a better product we are getting a bigger production from the same amount of labor. Altogether the labor situation with the building trades is far easier than it was one year ago."

In most instances materials are coming along fairly well although there has been trouble in getting brick and plaster in sufficient quantities. However, these are coming easier now.

The big plant of many buildings, started last spring by the Pennsylvania Rubber Company, and abandoned when less than half constructed and sold to the Dupont Fabricated Silk Company, is now being completed by the latter firm which recently renewed the building operations. This job will last probably all of next year. The big plant of Dunlop American, Ltd., to be the American branch of the Dunlop Tire Corporation of England, which was begun last spring is expected to be completed by the first of the new year. Though it will employ 5,000 men when done, work has been rushed to such an extent as to finish it in record time if all continues to go well. Help has been advertised for lavishly and paid well.

Another building project here which is an innovation for this city is the large seven or eight-story apartment building in Elmwood avenue, between Summer and North streets. This is built on the latest New York plan.

As to definite projects in the building line here for next year little can be predicted. Many big things are being talked and it is generally conceded that, while high cost of materials may cause many of them to be only just talked, the real factor which may halt their fruition will be financial conditions.

Capitalized at $1,500,000 the Great Eastern Gravel Corporation has filed a certificate of incorporation with the county clerk. The company, whose principal offices will be in Buffalo, owns government gravel concessions from Old Field Point to Mount Misery Point in Port Jefferson harbor, Long Island. The directors are George A. Keating and William F. Wierling of Buffalo and George D. Perry of Port Jefferson, L. I. The company will take over and develop the business of the Eastern Gravel Corporation, a Buffalo company, and will start business with $300,000, the papers show.

Canadian Rates Not Raised

Pit and Quarry Products Exempted from Recent Increase

By Our Canadian Correspondent

A DECLINE in the amount of construction work going on in Canada is indicated by the latest figures of building permits, for August last. These totaled $9,439,807 for the 56 cities of the Dominion, compared with $13,025,560 for July, 1920, and with $11,916,045 for August last year. The only province to show an increase is Quebec, building activity there having revived considerably during the month. Alberta shows an exceptionally large decline, as July was an exceptionally busy month in that province.

Generally quieter conditions in the building supply industry are reported by dealers in stone, gravel, lime, etc. In an interview with the writer, Mr. G. W. Raynor, who is manager of the Ontario Rock Company, stated there is a moderate demand for the materials they supply. The Ontario Rock Company operate large trap rock quarries at Havelock, Ont., and supply material for almost all the foundation work in southern Ontario. In this connection he pointed out that trap rock is not affected by the action of chemicals as is limestone, and that it is essential that it be used for paper mills and similar plants. The company is confident of future growth and has this year spent $175,000 on extending its operations.

Trap rock is also placed on the Canadian market from quarries near Montreal and in the maritime provinces, the Martin International Quarries being one of the largest producers in the east. The demands in northern Ontario and in the west are supplied by quarries at Bruce Mines, Sudbury, and Port Arthur, Ontario, and at Calgary, Vancouver and a few other points in the west. There is practically none exported to the United States, however, because of the duty of 27 to 30 cents per ton. The above mentioned Martin International Quarries was, as a matter of fact, organized to ship stone to the eastern states, before this duty was levied by the United States government, but the subsequent action of the government cut off this business.

Rock, sand and gravel have been exempted from the increase in railroad rates which went into effect in Canada a few weeks ago. This is a very important concession, as it would have greatly restricted the market for these materials by enhancing the price in cities. The increase applies to brick and terra cotta, however, and manufacturers are trying to get a similar concession for these products. F. B. McFarren, general manager of the Interprovincial Brick Company, which ships large quantities from its plant at Cheltenham, Ont., maintains that the railways' earnings on this class of business are already high and that the old rates were sufficient.

Shippers still complain of a car shortage, which is preventing them from filling orders already on their books. This is confirmed by the fact that considerable construction work is still held up through inability to obtain stone, cement, and gravel. An example of how the shortage handicaps quarries is given in a recent statement of G. W. Essery, of Crushed Stone, Ltd. The quarry which this firm operates at Kirkfield, Ont., has a capacity of 1,000 tons a day and shipments of from 18,000 to 20,000 tons a month should ordinarily be made. However, as the firm is securing only 175 to 200 cars a month, instead of the 400 to 500 that are necessary, shipments have been substantially reduced. From the Kirkfield quarry only 8,000 tons were shipped in September, com-

pared with nearly 15,000 tons in June, and the firm is in consequence losing from $5,000 to $8,000 of business per month and quarry labor is drifting away.

The inability of private plants to supply stone for road work is inducing some of the provinces to install crushing plants of their own. Such a plant is operated now by the Ontario Hydro-electric Commission for its work on the Welland canal. Quarry owners point out, however, that this is not an economical measure in the case of road materials, as only a limited number of sizes can be used and a government plant cannot find a market for other sizes. In a commercial quarry there is a market for all sizes produced.

At the annual convention of the Ontario Architects' Association, held recently in London, Ont., the use of Canadian materials was advocated. H. E. Moore, president, stated that a committee had discussed the subject with the Canadian Manufacturers' Association. "We as architects," he said, "should consider it our duty to adopt some policy that will not only increase the use of Canadian building materials, but that will aid in raising the standard of such materials."

Hodgson Sand & Gravel Company, whose offices are on Broad Street, Newark, N. J., have incorporated, having a capital stock of $300,000. They will operate sand banks, gravel pits, quarries, etc.

With a capital stock of $1,500,000 the Great Eastern Gravel Corporation has filed certificate of incorporation. The main office of the company will be in Buffalo, N. Y. It owns government gravel concessions in Port Jefferson Harbor, L. I., and will take over and develop the business of the Great Eastern Gravel Corporation, a Buffalo concern. The firm will begin business with $300,000. The directors of the company are George A. Keating and William F. Wierling of Buffalo, and George E. Perry of Port Jefferson.

Cars Denied in Indiana

Commission Still Insists on Giving Preference to Coal

By Our Indianapolis Correspondent

A PETITION asking the Indiana public service commission for an order directing the steam railroad companies to supply open-top equipment for transporting sand and gravel has been denied by the commission. The commission bases its decision upon the general facts that the transportation of coal at this time supersedes in importance the transportation of sand and gravel.

"While the need of movement of sand and gravel and other construction materials is pressing," the order of the commission states, "still at this particular time the commission is confronted with the more imperative national as well as local need of transportation of coal. Especially in light of evidence showing material movement in supply of cars to the sand and gravel trade, this commission is not inclined to place itself in the way of complictaing national and state efforts to increasing production and distribution of coal.

"The commission recognizes the seriousness of the situation, yet it is of the opinion that, at least for the present, in view of the improvement in the car situation, the present arrangement ought not to be disturbed. The commission will lend and has lent its influence in securing equipment in those cases which seem to need prompt attention."

The Indiana Sand and Gravel Producers' Association filed a petition September 2 asking the commission to revise its distribution of open-top cars in order to facilitate movement of sand and gravel in Indiana. L. H. Wright, director of the Indiana Highway Commission, filed an intervening petition shortly after, asking about the

same of the public service commission. In his petition he set forth the fact that the road building program of 1920 was being seriously handicapped through lack of transportation for sand and gravel.

It was averred in the association's petition that sand and gravel were essential to general construction; that it can be transported only in open-top cars; that shipments have been restricted on account of service orders of the interstate commerce commission, which orders were held to be unlawful since they applied to intrastate traffic and were discriminatory.

The hearing before the commission demonstrated the fact that the sand and gravel industry of Indiana needs to pay more heed from an individual standpoint to matters pertaining to the industry in general. Only three members of the industry testified before the commission, while about twenty-five railroad officials appeared to tell their views in the case.

Statistics recently compiled by the Indiana association give some startling figures concerning the shortage of material in the road building program of this year. At the present time there is a market for road building work alone of more than 5,600 cars of sand and gravel, and during the past three months more than $1,500,000 worth of road work has been tied up more or less because of shortage. Statistics show, furthermore, that the average car service to the industry during the year thus far has ranged from 30 to 35 per cent of the maximum requirements.

Incidentally, no indications are to be seen that there will be a slump in the demand for sand and gravel, either during the winter or next spring. At the present time several of the large industries about Indianapolis which have had under progress during the past year some extensive expansion work consisting of fireproof construction are completing these improvements, so that the demand will fall off from this particular work, but on the other hand, several other industries have announced that they intend building just as quickly as possible extensions of reinforced concrete construction that will create a new demand.

One bright ray in the spring prospect is the fact that the Indiana Highway Commission is intending proceeding with its road building program, a program that contemplates the construction of 3,200 miles of hard-surface roads during the next eight or nine years. Next year's program calls for the construction of nearly 400 miles of this sort of road, and the demand for sand and gravel—for they all are having a concrete foundation, is certain to be enormous.

Another bright spot at the present time is the coal situation in Indiana. Coal operators are not producing at maximum capacity by any means, and there have been several times recently that the sand and gravel man has made good use of surplus cars that originally were intended for the coal trade.

A phosphate deal which is said to be the most important one of its kind in that section of the country, was recently closed by the American Agricultural Chemical Company as the lessee and C. D. Loveless, as lessor, the deal involving 334 acres of phosphate lands near Carter's Creek, Tenn., for a consideration of $150,000— $50,000 cash and the balance in royalties of $1 per ton at the rate of $25,000 per year for four years. The quality of the rock in this tract is said to be the highest grade in that part of the state. Development is already under way. A spur track is being built by the A. A. C. Co. from the property to the main line of the Louisville & Nashville Railroad near Cleburne Station.

The quarry of D. L. Taylor & Company, Inc., at Wilmington, Del., has taken over by the Arundel Corporation, the latter company now operating the quarry.

Texas Demands Gravel

Road Building Continues to Take Large Quantities of Material

By Our Dallas Correspondent

GRAVEL dealers in Dallas county report an increasing demand for their product, both from road builders and contractors and also for building operations. The tightness in the money market during the summer months which for a time held up building operations has been relieved, at least partially, and building is being everywhere resumed in this section. Crops are beginning to move and this factor has been important in the loosening of credits.

Slight improvement is also reported in the transportation situation, although it is yet impossible to secure all cars needed for transporting sand and gravel. The car supply, dealers say, has just about doubled within the last thirty days, but that the present demand is for something like double the number of cars now placed at their disposal.

Dallas county is soon to go forward with its roadbuilding program, for which $6,500,000 in bonds was recently voted. This program of roadbuilding has been tied up by friction in the County Commissioners' Court over the form of contracts to be awarded—whether on the cost-plus plan or straight contract for finished job—and also over the employment of a county engineer to supervise the work. A county engineer has now been employed and it has been decided to proceed on the straight contract basis, and contracts are to be awarded soon for two highways, both of concrete, and involving the construction of approximately 30 miles of roadway. Dallas county is thus entering the local field as one of the largest purchasers and consumers of gravel and this fact has greatly stimulated the local gravel market. Dallas county has gravel pits of its own and does its own hauling on many jobs with its own fleet of motor trucks loaned by the Government, but with the large road contracts, large quantities of gravel will be purchased under contract for delivery on the job.

Other counties nearby are also launching extensive road building programs and are in the market for large quantities of gravel. Johnson County, which recently awarded several large gravel contracts, is again asking bids for delivery of 10,000 cubic yards or more of pit-run gravel on the Johnson County highways. This county is doing most of its highway construction under the cost plus plan and the county is purchasing the gravel used.

Tarrant, Denton, Collin, Fannin, Hill, McLennan, and other counties are building highways and all of these counties draw on the Dallas county gravel supply to a certain extent in their road construction.

While the demand for gravel has increased appreciably, and an improvement is noted in the transportation situation, prices have remained the same. Gravel f. o. b. cars at the pits is being quoted at $1.25 to $2.50 per cubic yard, while gravel delivered on the job varies from $2.50 to $4.00 per cubic yard, depending on hauling conditions and distance.

The marble quarry of the Wallowa Marble & Granite Works, of LaGrande, Oregon, which is located at Lostine, Ore., will be opened probably within the next few months. Examinations have been made in both by government officials and private parties of the marble deposits found in the Lostine mountains, and found this to be the first marble deposit of real merit in the western part of the United States, as previously marble of such quality had to be brought from Vermont and Alaska. Mr. Alfred Kline of LaGrande, Ore., has charge of the work of opening.

Better Shipping Facilities

Louisville Reports Better Car Situation—Other Notes

By Our Louisville Correspondent

THE main feature of the situation in Kentucky so far as quarry operation and the movement of sand and gravel is concerned is in that of late there has been a better car supply and improved shipping facilities generally. This does not mean that cars are much more plentiful for all quarry operations, because there are still quarries shut down and others handicapped by lack of cars. It does mean, however, that the trade in general has obtained some relief and the indications point toward some catching up in orders and in the making up of deliveries through October and November and until bad weather sets in or the cotton movement in the south becomes heavy enough to burden the transportation facilities.

R. B. Tyler says, in the matter of car supply, that he finds more cars available for shipping brick and other building material, and they are moving along very nicely at their crushing plant at Buffalo because they have local distribution there on road contracts, but his plant out of Louisville is still closed down and he does not figure that he will be able to start it up before spring. He intends going to Washington soon and making an appeal to the heads of the Southern Railway to make such provision in the matter of car supply that he may be able to start up next spring with some assurance of steady running.

The local sand and gravel people expect to be kept very busy from now till cold weather stocking their yards for the winter needs as well as taking care of the current demands.

While the weather has been fine and conditions generally have made for a good volume of trade out in the surrounding territory, actual shipments of late have been held in check a little by two influences. One was a heavy stocking up on the part of local dealers before the new freight rates went into effect, and the other is a scarcity of cement which has limited the amount of trade local dealers can take care of. Taking it all together, however, the season has been a good one and the trade here is looking forward cheerfully to the future, and meantime is busy at work laying up a reserve stock to carry through the winter months.

The Continental Car Company of America, in Highland Park, a suburb of Louisville, has increased its capital stock from $500,000 to $1,150,000. This concern, in addition to making auto bodies, makes a line of dump cars for quarries, gravel and sand pits, and the increase in capital is to cover enlarged operations.

Reports from Frankfort, Ky., state that Joseph S. Boggs, state highway engineer, has declined to accept any of the bids for road construction in Whitley, Laurel and Barren counties because the bids are too high. For this reason it is said no more contracts for road building will be awarded this year by the state highway commission unless some sharp reduction in price is shown, because it is believed better prices will be available in the spring. This will tend to put a damper on winter operations, and when bids are opened again for spring work it will be in the hope that lower prices will prevail.

Announcement is made by the Sanderson-Cyclone Drill Company, Orrville, Ohio, that they have appointed W. F. Nothacker, as vice-president, who will head the eastern and export office at New York City. They also desire to notify their business friends that the New York office has been removed to Room 436, Hudson Terminal Building, 30 Church Street, telephone Courtland 7333.

Mining Congress to Meet

Denver Chosen for the Annual Convention This Month

THE twenty-third annual convention of the American Mining Congress will be held in the Albany Hotel, Denver, Colo., November 15 to 19, inclusive.

In calling the coming convention, the American Mining Congress makes the following announcement:

"Heretofore the calls for such conventions have been somewhat general in character. The present condition of the mining industry and the peculiar problems now facing all industrial undertakings in the United States, create a psychological reason for calling together the mining men of America for an open, frank and unhampered discussion of these problems and conditions—state and national."

This is essentially a business man's convention, and all men and women interested in the production of America's basic wealth will be eligible to participate in the conferences.

Following are the most important of the general divisions of work which will be discussed by the convention—so far as the sand and gravel, crushed stone, cement, gypsum and lime industries are concerned:

Industrial—Present day relations between operator and employe; improvement of efficiency; wages; hours; working conditions; contracts.

Legislation—Tariff pertaining to the products of the mines; uniformity of national and state mining laws; revision of the general mining code; state and national blue sky laws; employers' liability laws.

Standardization—There will be a national conference on the standardization of mining machinery, equipment, labor and life-saving devices, safety codes, government and state co-operative methods, marketing and accounting.

Taxation—The existing excess profits tax law having proven unworkable, unfair and destructive to business, the American Mining Congress is conducting efforts looking to the presentation to the next session of the United States Congress of a revision of the present cumbersome statutes. A committee representing all industries is now at work on this matter and will present a report. This conference will also discuss state tax laws, which are now confusing and burdensome. An interstate committee on uniformity of tax laws is suggested.

The Standardization Committees of the American Mining Congress will meet previous to the conference sessions to consider and prepare a report for consideration of the conference proper.

These committees, which took up their activities two years ago, held their first annual joint meeting at St. Louis in 1919. They have now divided their work into two general subdivisions—metal and ore—each with proper subdivisions covering the principal aspects of the complex problems of mining operation.

The Standardization Committees are extending an invitation to all manufacturers of mining machinery, all engineers, all operators and their officials, and to all national organizations interested in the subjects to be discussed.

The exposition which was held in connection with the annual convention at St. Louis last year proved to be a successful experiment. It was decided to have such an exhibition at all subsequent annual conventions, but as it was impossible to find suitable quarters for such a large exposition in Denver this year, it becomes necessary to adopt a plan for giving a strictly educational and scientific exhibit, which will be under a special committee working with the permanent American Mining Congress Committee on Standardization.

The Tennessee Stone Company, Chattanooga, Tenn., has increased its capital to $150,000.

Death of Rubber Manufacturer

The death of Mr. Elisha S. Williams, vice-president of the United States Rubber Company, on October 8, 1920, was a great shock and profound sorrow to the host of friends both in and out of the organization who knew and loved Mr. Williams.

Mr. Williams possessed qualities of heart and mind which endeared him to a wide circle of friends and acquaintances. Courteous, considerate of others, kindly, with always the best interests of his associates at heart, he won the liking and good will of all with whom he came in contact.

Mr. Williams was born in Malden, Mass., in 1873, and was educated in the Malden public schools, taking a business course in the Malden high school. He then entered the employ of the Revere Rubber Company, and in the course of a few years became the New England manager, a little later the Chicago manager, and in a year or two was promoted to the position of general sales agent, which, in turn. led to his assuming the chief executive position in that company as treasurer, and later president.

January 1, 1910, the Revere Rubber Company was purchased by the United States Rubber Company, chiefly because of its desire to secure the services of Mr. Williams, who was then elected president of the Rubber Goods Manufacturing Company, which at that time, through its subsidiaries, controlled all the mechanical and tire business of the United States Rubber System. Mr. Williams was largely instrumental in the consolidation of the tire business of the company's subsidiaries by forming the United States Tire Company in 1911, of which he was the president until 1915. In 1915 he was elected vice-president of the United States Rubber Company, in charge of the mechanical goods business. He was also a director of the United States Rubber Company, a member of the operating council, and president of several subsidiary companies.

The Volusia Coquina Rock Company, Volusia, Fla., has been incorporated with a capital of $75,000 to operate a stone quarry in this district. W. S. Bowdon, New Smyrna, Fla., is president; F. S. Myer, Volusia, is secretary and treasurer.

Car Pullers

The Stephens-Adamson Manufacturing Company, Aurora, Ill., have issued a new bulletin of several different types of motor-driven safety car pullers, which are part of this company's output. For use in industrial plants where railroad cars are to be moved about on switch tracks, they furnish at once a convenient, safe and economical method of solving the car-handling problem. Some are of the self-contained motor-driven type, while others are belt-driven.

For the former, the motor requirement in all cases is only 7½ h.p. for any of the various types, the motor being for either alternating or direct current, and connected direct to the machine through cut spur gears. Power is consumed only during the time of actual operation of the machine, which is one of the economical features of operation. All of this type have a capacity of 4,000 pounds rope pull.

These machines require the operation of but one man, and as the mechanism is exceedingly simple, this need not be an expert operator. All that is necessary with either type car puller is the turning on of the switch, snubbing the rope with several turns around the slow-moving capstan, and the machine does the work, one man being able to move many cars in a short time.

Size of capstan in all the different types is 8 inches by 10½ inches. The speed of the capstan varies, being 16 to 20 r. p. m. in the self-contained motor car puller, while the pulling speed of these capstans is from 30 to 40 feet per minute, with the exception of the Junior model, Style No. 17-J, which is a small, compact machine, with sufficient pulling capacity to meet certain requirements of small industrial concerns.

James B. Russell, Winchester, Va., and associates, have taken an option on property near Cedar Creek, Va., comprising about 400 acres of limestone lands, and have tentative plans under way for the establishment of a large quarrying and crushing plant. Tests are being made of the property and if the results show a supply sufficient to last for 15 years and longer, as now anticipated, it is proposed to expend about $300,000 for the proposed works, including machinery.

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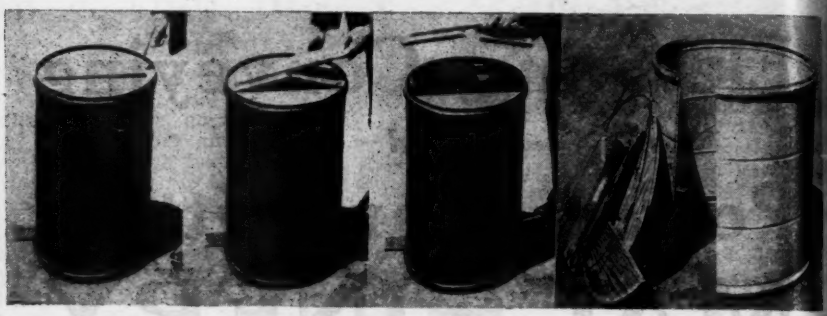

Various stages of the Knapp Knock-Down Barrell

A Knock-Down Barrel

The lime industry has been asking for a container which will be better adapted to keeping the contents in good condition than the ordinary wooden barrel.

Such a container has been developed by S. A. Knapp of San Francisco, and preparations for its manufacture are being made by the Knapp Metal Barrel and Package Company of that city.

This container can be shipped back to the factory either set up or knocked down, as preferred.

It consists of a body of sheet metal, with wooden heads. The lower head is put in at time of assembling and is of the ordinary type of barred head. The upper head is the part especially covered by patent, and is so designed as to be inserted after the rest of the barrel is assembled and filled without expanding the croze or top of the barrel. The illustration above shows how this is done.

The barrels are held together with wires, which are cut when it is desired to return them knocked down, and the bodies are nested. One barrel in eight is left set up and is used for heads and wires. In this way the return occupies about 30 per cent of the space of the original shipment.

The barrels are easily assembled on a mandrel at the plant where filled, and rolls can be installed to smooth out dents.

When it is desired to make the barrel air and moisture proof, a paraffined strip of cloth is inserted in the longitudinal joint of the body.

These barrels have already been tried for shipping lime and cement, as well as many other materials, and have given the best of satisfaction.

Republic Belting

The Republic Belting Company, Inc, Baltimore, Md., recently incorporated under the laws of the state of Maryland. This company purchased an extensive tract of land known as the Albrecht property, fronting on Smallwood street, from Pratt to McHenry, having a frontage of 256 feet, where they have ample facilities for their purpose, such as natural light, etc. Their capital stock is $200,000, of which $100,000 consists of 8 per cent preferred, while the balance is common stock.

Mr. Charles Dankmeyer, president, has been in the belting business for nineteen years in various capacities, and has associated with him a personnel of able assistants, among whom are Mr. George L. Mark, superintendent, who has a thorough practical knowledge of belting, having been in this business a lifetime, and for many years has been in charge of belting plants in the same capacity. Mr. Huldreich Egli, well-known construction engineer, has charge of the building, which will be a model plant in its line. The factory is expected to be ready for operation about November 1, 1920.

The company will place on the market a number of different brands, to be known as "Duratex" canvas, "Republic" leather, and "Republic" rubber. Cognizant of belting requirements for different purposes and under varying conditions, the policy of the company will be to adjust the type of belting to the particular need in each case. Their Practical Belt Man will study every belt problem, and advise in the best interest of patrons. This service is absolutely gratis—no obligation incurred.